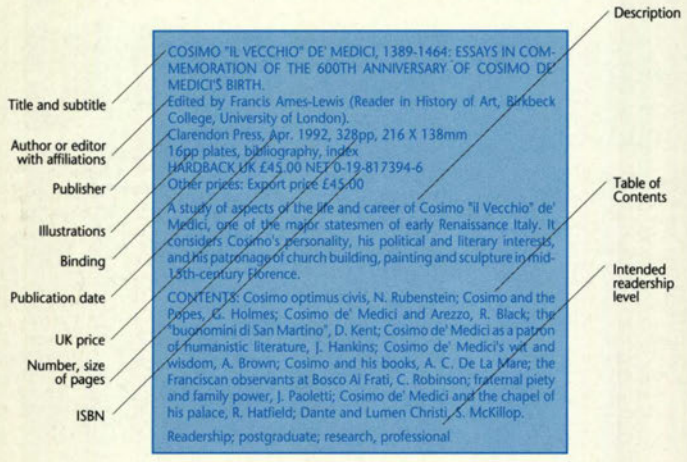
COLLEGE & RESEARCH LIBRARIES

NOVEMBER 1993
VOLUME 54
NUMBER 6

For the record, BookFind-CD offers the most comprehensive title information in the world.



Introducing BookFind-CD World Edition– instant access to more information on more titles than ever before.

The most sophisticated bibliographic database of its kind, BookFind-CD provides access to over 1.3 million English language titles from all over the world.

Among the many benefits of this unique reference tool is the availability of detailed, descriptive records like the one above, that provide an unprecedented amount of information for many of the titles in the database.

What's more, with over 2000 subject classifications, users can search for and locate titles with great accuracy– using information ranging from author or title to *any* word or phrase.

And once you find the information you want, you can manipulate it to meet your needs–and receive it in any of 20 different output formats.

In addition to the original version, BookFind-CD is available in special, more specific packages, including Medical/Healthcare and Business/Law. So no matter what your needs, there is a BookFind-CD that's just right for you. For more information on any of the BookFind-CD packages, call Baker & Taylor at **1-800-775-1800.**

BOOK FIND CD ROM WORLD EDITION

Distributed by Baker & Taylor

BAKER & TAYLOR
Information and Entertainment Services

WE HAVE SOME GREAT STOREYS FOR YOUR LIBRARY.

(And over 81,000 other intriguing people.)

STOREY, CHARLES PORTER, lawyer; b. Austin, Tex., Dec. 4, 1922; s. Robert Gerald and Frances Hazel (Porter) S.; m. Helen Hanks Stephens, Oct. 14, 1950; children: Charles Porter, Harry Stephens, Frederick Schatz. BA, U. Tex., 1947, LLB, 1948; LL.M., So. Methodist U., 1952. Bar: Tex. 1948. Pvt practice law Dallas, 1948–; dir. Storey Armstrong Steger & Martin Profl. Corp., 1972–. Pres. Dallas Inn of Ct., Dallas Day Nursery Assn., 1958, Greater Dallas Coun. Chs., 1970-1971; chmn. Internat. Com. YMCA, 1969-1971; mem. nat. bd. U.S. YMCA, 1964-1975; pres. Children's Devel. Ctr., Dallas, 1959; chmn. bd. trustees Southwestern Legal Found., 1980-1990; trustee Coll. Dentistry, Baylor U., 1981-90. 1st lt., pilot USAAF, 1943-45, ETO. Decorated Air medal. Fellow Am. Coll. Trial Lawyers, Am. Bar Found., Tex. Bar Found.; mem. ABA, Tex. Bar Assn. (dir. 1976-79), Dallas Bar Assn. (pres. 1975), Philos. Soc. Tex., Dallas Country Club, Crescent Club, Idlewild Club, Phi Delta Phi, Phi Delta Theta. Mem. Christian Ch. (Disciples of Christ). Office: 4600 First Interstate Bank Tower 1445 Ross Ave Dallas TX 75202-2733

STOREY, KENNETH BRUCE, biology educator; b. Taber, Alta., Can., Oct. 23, 1949; s. Arthur George and Madeleine Una (Mawhinney) S.; m. Janet Margaret Collicott, June 6, 1975; children: Jennifer, Kathryn. BSc with honors, U. Calgary, Alta., 1971; PhD, U. B.C., Vancouver, Can., 1974. Asst. prof. Duke U., Durham, N.C., 1975-79; assoc. prof. Carleton U., Ottawa, Ont., Can., 1979-85, prof., 1985–; invited lectr. at various confs., univs. Mem. editorial bd. Cryo-Letters, 1983–, Jour. of Exptl. Zoology, 1989–, Copeia, 1989–, Am. Jour. of Physiology, 1991–; contbr. aricles to profl. jours. Killam fellow Can. Coun., Sheffield, U.K., 1975-77; recipient E.W.R. Steacie award NSERC Can., 1984-86. Fellow Royal Soc. Can.; mem. Am. Soc. biol. Chemists, Can. Biochemical Soc. (Ayerst award 1989), Can. Soc. Zoology, Soc. Cryobiology, The Explorers Club. Avocations: movies, music, Renaissance art. Office: Carleton U Dept Biology, Colonel Bay Drive, Ottawa, ON Canada K1S 5B6

For the real story on America's most accomplished men and women, there's only one book researchers count on for authority, accuracy, and attention to detail: the original *Who's Who in America*, from Marquis Who's Who.

And this year, *Who's Who in America* is better than ever. Now updated annually and with the new Geographic/Professional Index volume included at no additional charge, the 48th edition is a big story in itself!

MARQUIS Who's Who in America®

A REED REFERENCE PUBLISHING COMPANY

To put 81,000 of America's greatest stories on your reference shelves, call our toll-free number today.

To order your 1994 edition, call 800-521-8110 today.

COLLEGE & RESEARCH LIBRARIES

NOVEMBER 1993
VOLUME 54
NUMBER 6
ISSN 0010–0870

COLLEGE & RESEARCH LIBRARIES

College & Research Libraries (ISSN 0010-0870) is the official journal of the Association of College and Research Libraries, a division of the American Library Association. It is published bi-monthly at 50 E. Huron St., Chicago, IL 60611. Second-class postage paid at Chicago and at additional mailing offices. **POSTMASTER**: Send address changes to College & Research Libraries, Subscription Department, c/o CHOICE Magazine, 100 Riverview Center, Middletown, CT 06457–3445.

Manuscripts of articles should be sent to the Editor: Gloriana St. Clair, c/o E506 Pattee Library, The Pennsylvania State University Libraries, University Park, PA 16802; 814-865-1858; FAX: 814-863-7293. INTERNET acct.# gss@psulias.psu.edu. Copies of books for review should be sent to Stephen Lehmann and Robert Walther, Reference Department, Van Pelt Library 6206, University of Pennsylvania Libraries, Philadelphia, PA 19104.

Advertising office: Stuart M. Foster, Advertising Sales Manager; Dolores L. LaPointe, Advertising Coordinator, *Choice*, 100 Riverview Center, Middletown, CT 06457, 203-347-1387. Production and circulation office: ALA Production Services, 50 E. Huron St., Chicago, IL 60611: David Eptstein, Eileen Mahoney, Dianne M. Rooney, Bruce Frausto, and Josephine C. Sharif, Project Editor. Change of address and subscription orders should be addressed to College & Research Libraries, Subscription Department, c/o CHOICE Magazine, 100 Riverview Center, Middletown, CT 06457–3445, at least two months before the publication date of the effective issue.

Subscription price: To members of ACRL, $25, included in membership dues; to nonmembers, U.S. $50; Canada and Mexico $55; and other foreign countries $60. Retrospective subscriptions not accepted. Single copies and back issues, $14 each.

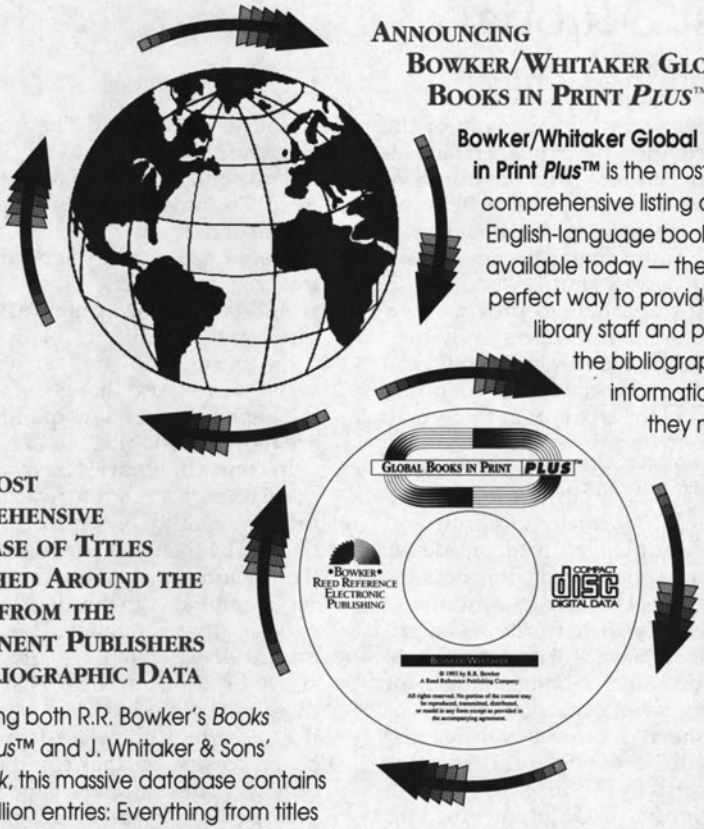
Inclusion of an article or advertisement in *College & Research Libraries* does not constitute official endorsement by ACRL or ALA.

A partial list of the services indexing or abstracting the contents of *C&RL* includes: *Current Index to Journals in Education; Information Science Abstracts; Library & Information Science Abstracts; Library Literature*; and *Social Sciences Citation Index*. Book reviews are included in *Book Review Digest, Book Review Index*, and *Current Book Review Citations*.

The paper used in this publication meets the minimum requirements of American National Standard for Information Science—Permanence of Paper for Printed Library Materials, ANSI Z39.48-1984.∞

YOU ASKED FOR THE WORLD—

As communications technology makes the world a smaller and smaller place, global coverage has moved from an innovation to a necessity. Patrons once satisfied with books published in the U.S. now demand access to titles published around the world.



ANNOUNCING BOWKER/WHITAKER GLOBAL BOOKS IN PRINT *PLUS*™

Bowker/Whitaker Global Books in Print *Plus*™ is the most comprehensive listing of English-language books available today — the perfect way to provide library staff and patrons the bibliographic information they need.

THE MOST COMPREHENSIVE DATABASE OF TITLES PUBLISHED AROUND THE GLOBE FROM THE PREEMINENT PUBLISHERS OF BIBLIOGRAPHIC DATA

Comprising both R.R. Bowker's *Books in Print Plus*™ and J. Whitaker & Sons' *Bookbank*, this massive database contains over 2 million entries: Everything from titles published in the United States, the United Kingdom, and Canada — through the Canadian Telebook Agency — to European titles covered in K. G. Saur's *International Books in Print* and D.W. Thorpe's *Australian Books in Print* and *New Zealand Books in Print*. And it's easy to use because it features the renowned ***Plus* System**™ software interface.

Learn what this vital bibliographic tool can do for you. For more information on **Bowker/Whitaker Global Books in Print *Plus*** and information on network editions and upgrades, just call toll-free **1-800-323-3288.**

November 1993 • 1-year subscription • $1,995.00

•BOWKER•
REED REFERENCE
ELECTRONIC
PUBLISHING
121 Chanlon Road
New Providence, NJ 07974

Guest Editorial

The Coming Contest

If, as now seems likely, many of the services provided by publishers and libraries in the current print environment will be done increasingly by writers and readers for themselves once the most heavily used information becomes available online, opportunities for both libraries and publishers to provide their services to academic users well may diminish. While the new online medium will doubtless spawn new service possibilities, the plain fact is that there may not be enough room in a primarily online environment for both academic libraries and commercial publishers of specialized scholarly information to grow and to remain key players in the academic information services arena. It is possible that libraries, if they are to continue to fulfill effectively their functions as primary service agents, will decide either to take on additional responsibilities for specialized scholarly publishing—or that publishers, in order to survive and expand, will need (and will have the technical capacity) to assume many of the mediation and distribution functions previously performed by libraries.

If this is true, and either academic libraries or scholarly publishers—but not both—will eventually prevail in a primarily online environment, then which should it be? Of course, academic libraries will agree easily that ultimately libraries should succeed, because they are more directly concerned and better able to deal with the information needs of academic users. Publishers, or at least the commercial ones, are indeed business enterprises, and customer service is not the fundamental purpose of business despite the proclamations of the current "quality" movement. The fundamental purpose of business is to stay in business: to grow and to increase return on investment. Customer service is merely a means to that end. If growth and revenue could be better achieved by ignoring or maltreating customers, then customers would be ignored or maltreated. Therefore, service quality is relatively simple for a business to define: high-quality services are those that generate increasing revenue, and low-quality services are those that do not.

In contrast, libraries have at their disposal no such straightforward method to measure quality of service, and are also obliged by their professional culture and their institutional commitments to view service not as a means but rather as an end—so that all actions taken and all resources expended are justified exclusively by that purpose. That being the case, what would happen, one wonders, if at a certain point academic libraries began to suspect that commercial vendors were developing a capacity to provide better service at a distance than libraries were able to provide on site? If service is the exclusive purpose of libraries, rather than a means to "stay in business," then would libraries, seeing that publishers could do a better job, simply convert themselves into warehouses, and advise their institutions to use the funding previously spent on libraries to provide instead access to the services of publishers (which would by that time have expanded themselves into full-service scholarly information brokerages)?

Of course not. But the reason this will not happen is neither because libraries are imbued with some super-competi-

tive spirit, nor because libraries are necessarily equipped to provide better services, but rather because libraries know so little about the quality of the services they do provide, that they would probably never notice that an outside agency was capable of doing a better job. Because service is so difficult (in the absence of a convenient gauge like revenue) to monitor and assess, and because the real needs of academic users are so diverse and complex, and because the library has always had (by virtue of its proximity to its users) what amounts to a monopoly on campus for print information services, and finally because service is the library's only purpose for existence, the library has preferred and has been permitted to define service quality on the basis of whatever service levels it—the library—provides. Since high quality service is the only purpose for the existence of libraries, and since libraries exist, what they are providing must be high quality service. Libraries consequently will never be able to recognize, let alone admit, that another agency is providing academic information services superior to those provided by libraries, because that is by definition impossible. Only after users have in effect rendered libraries totally superfluous by abandoning them for commercial vendors will libraries in their current condition be able to recognize that their services were inferior.

What is to be done? To begin with, academic libraries need to acknowledge and to prepare for a situation in the not-too-distant future in which they will enter into a very real and strenuous competition with commercial scholarly publishers and other vendors to become the dominant information service providers for students and faculty users. The more online publication becomes the accepted mode, the more opportunities, temptations, and incentives libraries and publishers are going to find to bypass each other. While one result of this might be that libraries and publishers will become so preoccupied with each other's traditional activities that they will end up simply exchanging responsibilities over time, a much more likely scenario is that one or the other will become the prevalent academic information provider. Academic libraries (and publishers) would be very foolish not to begin preparations now for that coming competition.

Second, as part of this preparation academic libraries must dispense with the mistaken notion that publishers and libraries are in entirely different businesses. Both libraries and publishers are fundamentally information intermediaries between academic writers and readers. It makes no difference whatsoever whether those services are understood as ends or as means. In a primarily online environment, moreover, it will be users (i.e., writers and readers) rather than libraries who define quality service.

Third, libraries need to begin learning as much as possible about specialized scholarly publishing. To this end closer links should be established with computer centers and university presses. The aim should be a condition in which a faculty member, having completed something for publication, will bring that material to the library. The library will then ensure that the material is referred to a nationally qualified editorial board; if the board accepts the item for publication, then it will be the library (after having done the necessary cataloging or indexing) that ensures through its links with other libraries around the nation and around the world that the item is published; that is, that it is made known and available to students and scholars who are interested in the subject.

Fourth, and perhaps most important, academic libraries now need to begin to concentrate on personalizing and humanizing relationships with their users, because it is only through continuous personal contact and interaction that libraries effectively can begin to assess and refine service quality. We have become so absorbed and preoccupied with the ability of computer mediated communication and publication to eclipse location as a factor in scholarly collaboration and information services that we have ignored—or at least resigned ourselves to

the unfashionability of discussing—the very real isolation and dehumanization that increasing reliance on online sources will necessarily entail. While proximity to users may no longer allow academic libraries to assume a service monopoly, it does continue to provide libraries with their greatest opportunity to tailor services (including publishing) to meet local user needs—services that are demonstrably superior to those available exclusively at a distance. It will be risky and difficult, but there is no alternative: the more rapid the advances of information technology, the more willing academic libraries must be to invest in enhancing their human resources. This is the real challenge, and if we are able to meet it, then we will succeed finally in supplying a truly superior information service as defined not by ourselves but by the preferences of our users.

ROSS ATKINSON,
Cornell University

The NFS says more timber sales mean more logging which means more jobs. Even if the timber must be sold at a loss. Opponents say this annual deficit amounts to logging subsidized by taxpayers, and that the real motive is to build roads in previously roadless areas, preventing future wilderness designations.

IN THE FACE OF A $245 MILLION DEFICIT, THE NATIONAL FOREST SERVICE STILL SEES ONLY ONE WAY TO CUT ITS LOSSES.

The battle between environmentalists and developers is an issue of international importance. And so it is one of the thousands of diverse subjects covered by PAIS International.

A vast range of topics

From conservation to industrial espionage, PAIS provides information you won't find anywhere else. PAIS online and CD-ROM indexes offer access to over 350,000 journal articles, government documents, statistical directories, monographs, conference reports and more. And to provide an unrivaled international outlook, PAIS also references literature published around the world in English, French, German, Italian, Spanish and Portuguese.

So before you venture into a forest of information, cut through the clutter with PAIS.

Public Affairs Information Service,® Inc.
521 West 43rd Street, New York, NY 10036-4396
800-288-PAIS, 212-736-6629 (in NYC)
Fax: 212-643-2848

PAIS®

No one looks at the world like PAIS

In Print: PAIS INTERNATIONAL IN PRINT® • PAIS SUBJECT HEADINGS **Online Through:** DATA-STAR • DIALOG • OCLC • RLG
On CD-ROM: PAIS ON CD-ROM • PAIS INTERNATIONAL ON SILVERPLATTER **On Magnetic Tape:** CONTACT PAIS FOR INFORMATION

Mature Librarians and the University Faculty: Factors Contributing to Librarians' Acceptance as Colleagues

Jean A. Major

Abstract: In an exploratory study, eighteen mature librarians who are considered colleagues of teaching faculty were interviewed to understand actual instances of acceptance within an institution. Participants demonstrated that performing the role of librarian and exploiting campus governance activities contributed significantly to collegial acceptance and were used to advantage more often than a common interest in research. The most important factor, however, was self-confidence as a librarian. Models and mentors reportedly helped subjects learn to be colleagues with other faculty; library school often did not.

The Professional Liaison Committee of the Association of College and Research Libraries (ACRL) has focused, until now, only on other scholarly and professional associations and on techniques by which librarians might become more visible participants in them. In 1991, however, the ACRL Executive Committee approved an addition to the charge which gave a second focus to the committee:

> . . . In addition, the committee will seek to identify and promote strong relationships between libraries and institutional administrative, research and instructional units. . . .[1]

The committee interpreted this addition to its charge as a call for further exploration of the status, the respect, and the recognition which libraries, librarians, and library directors enjoy on local campuses. In early committee discussion about the charge, a suggestion was made that some mature librarians are able to function as colleagues of other faculty in situations where high regard for librarians is present. This paper is an exploration of that premise.

The voluminous literature concerning the status of academic librarians has focused mainly on questions of formal admission to the faculty. The association's official statements, represented now by the revised "Standards for Faculty Status for College and University Librarians" (1992), state the justification for faculty status and specify the privileges to which faculty librarians must have access.[2] In addition to thorough explorations of librarians' admission to faculty status itself, criteria for tenure and promotion are often debated. Discussions of techniques for overcoming logistical problems, such as scheduling time for research, are prominent as well.[3] A recent exploration of library faculty credibility, by W. Bede Mitchell and Bruce Morton, seems to turn from questions of simple admission to the faculty to a more ambitious level of academic citizenship. In this synthesis and interpretation of

Jean A. Major is University Librarian at Old Dominion University, Norfolk, Virginia 23529–0256.

existing research, the authors noted that the present socialization of academic librarians is inadequate to function in the research-centered environment of other faculty. After a detailed examination of the relevant shortcomings of librarians' graduate education, the article concluded with an extensive set of recommendations to foster an appreciation for research, and more important skills in performing research on the part of new librarians.[4] Little exploration has been undertaken concerning experienced librarians exhibiting successful library faculty behavior that is defined more broadly than research activity. Therefore, the perspective of the mature librarian—a person generally described as a colleague of the teaching faculty—was considered to be a fertile area for investigation and, moreover, an important vehicle for the committee's work.

Relevant concepts considered for this investigation of successful library faculty behavior are professionalism, especially the client-professional relationship, and collegiality. Librarians of all types consistently have embraced professionalism as the appropriate framework for their work. This model is defined, in part, by the requirements of formal training and specified credentials, by the existence of a code of ethics, and by autonomy in performing work. However, its most significant emphasis is on the delivery of expert services for a client—in which decisions about a client are made by the professional. The professional-client relationship is an essential part of this framework.

Collegiality, by contrast, defines relationships and interactions among members of the academic community—a community in which research and scientific inquiry are central and peers are primary judges of work. Mutual respect for expertise in research and teaching, shared values, and a decision-making style based on participation and consensus define collegial relationships. The framework of collegiality contrasts markedly with the concept of the professional interacting with a client, which has received such extensive attention in the literature of librarianship.

Four surveys of faculty opinion about the role and status of librarians were carried out during the eighties, at Southeastern Louisiana University, Southern Illinois University at Carbondale, University of Manitoba, and Albion College. Each survey included a question similar to the following: "Do you view librarians as: academics equal with teaching faculty, professionals, semi- or paraprofessionals, clerks, or others?" The majority of respondents in all surveys regarded librarians as professionals, but not as academic or faculty equals. The respective responses expressed in percentages were "professional"—60%, 65%, 68%, and 85%, and "academic equals"—38%, 28%, 29%, and 15%.[5] These consistent survey results contrast with the current aspirations of academic librarians to be regarded as colleagues, with all the mutual respect and shared values that collegiality implies. It is essential, then, to understand actual instances of acceptance of librarians as colleagues within the academic communities of their own institutions.

METHOD

An exploratory study was chosen to identify issues which deserve programmatic or further research activity by the committee or by ACRL. Acceptance as colleagues by other faculty was defined as the recognition of a partnership, a relationship of equal status—and, therefore, equal access to shared research, governance, or social experiences—with faculty outside the library. Using this definition, practicing university library administrators were contacted for names of librarians who are accepted as colleagues by faculty in their own universities—and therefore who would be suitable subjects to interview. Open-ended telephone interviews were conducted with eighteen mature librarians selected from these names to represent a variety of library service roles. Because of the exploratory nature of the study, sampling was not considered, and raw data were not analyzed statistically. Rather, themes for further consideration were identified.

The mature librarians who participated in the study had significant professional experience. More than half (11) had been librarians for twenty or more years. They represented a variety of aspects of the profession—collection development, reference, cataloging, serials, for example—but eight (nearly half) were subject specialists, representing science and engineering, social sciences, fine arts and music, and education.

Subjects came almost entirely from publicly supported universities; the median institutional enrollment in fall 1990 was 20,023. Most libraries (14) are ARL libraries; the remainder are comprehensive universities with a number of doctoral programs. Almost half of the participants (8) have professorial rank. The rest have alternate ranks (Librarian II, Associate Librarian, and so forth), but the privileges and responsibilities of the alternate ranks vary.

Questions asked of interview subjects were:

1. What kinds of contacts do you have with faculty in general?
2. How did the campus service aspect get started?
3. Are there some faculty whom you consider colleagues?
4. What are those relationships like? In what sense are you colleagues?
5. Identify some characteristics which would describe the relationships.
6. Are shared values a part of this?
7. Is professional library service a part of developing collegial relationships? How?
8. How did you learn to be a faculty member, to form professional friendships with other faculty?

FINDINGS

Are There Some Faculty Whom You Consider Colleagues?

Nearly half (8) of the participants of this study answered this question emphatically, "Yes! I consider them all colleagues." The others had a great many or a few faculty colleagues. Only one subject, one of the more junior participants, reported that she does not consider any faculty outside the library her colleagues. The following findings describe these relationships more fully.

Contacts with Faculty

Library service assignments provided opportunities for substantive long-time faculty contact for most study participants. The single most common element was collection development responsibility. Most participants, twelve of the eighteen, spoke of some degree of collection development work: long-time liaison with several departments, the serial review process, development of the general collection, or service as the chief collection development officer, as well as the collection development which accompanies the role of subject specialist. Half were involved with bibliographic instruction at some level, and nine had considerable contact associated with service desks. In addition, some subject specialists reported presentations to research seminars, consultations about research strategies for pursuing faculty or students' projects, or regular phone or in-person contacts with constituents. These reported contacts sometimes were highly systematic; one bibliographer indicated that he makes 100 phone contacts every three months to his constituents.

The majority of subjects in this study are well integrated into the governance structure of the university and serve on universitywide committees, the faculty senate, or senate committees. Typical committee assignments for these librarians concerned campuswide promotion and tenure review, sabbaticals, teaching excellence, military education, bookstore, and senate library committees. Represented, although less common, was service on college curriculum committees, the senate steering committee, or the university's academic planning committee. One subject had served recently as president of the university senate, and another was a recent member of the university's athletic council. Service as Senate president carried with it the opportunity to serve on search committees, first for the university's president and then for the provost. Only one other participant reported regular

service on search committees for nonlibrary positions.

Faculty contacts related to research were less frequent and more varied than other kinds of contacts. Only seven subjects specifically reported that they talked with teaching faculty about their research; five also discussed their own (librarians') research with their faculty colleagues. Other reported research-related activities were: service on thesis, dissertation, or other doctoral committees (3 participants); attendance at campus seminars, lectures, and colloquia as often as possible (3—all subject specialists); joint research projects (only 2 participants); participation in a campus research center, interacting with other participants and giving papers (2); and service as a peer reviewer for a campus grant program (a single participant).

The Process

Many participants credited faculty status with creating opportunities to develop collegial relationships through campus service. Some universities' long history of faculty status for librarians makes this easier. Campus service opportunities opened up for some librarians only when they received faculty status midway in their careers. Where representation from each academic unit is required, librarians' participation is guaranteed, and some respondents have made use of these opportunities. In addition, all faculty—including librarians—receive forms to volunteer for Senate committees in most universities; those who respond frequently are chosen.

For other universitywide committee assignments, the recommendation or nomination of the library's administration was reported to be necessary—and one subject indicates she makes a practice of asking her administration to nominate her for activities in which she wishes to participate. Others noted that a supportive director made a big difference in gaining access to campuswide service opportunities. Only one subject with high campus visibility reported that he did not get encouragement from the library's administration to become active.

"It just goes on and on. Once you get started, they think of you." This quote from a highly visible campus politician suggests two themes mentioned by several subjects—becoming known and developing a track record. This librarian chaired a committee during the first year of her service in the Senate. As chair of the bookstore committee, she presided effectively over "a major Senate battle" and thus became known and respected. Another subject, an immediate past president of the faculty Senate, built a record over time, beginning with the American Association of University Professors (AAUP) and then in the Senate. She put in a great deal of hard work, showing what she could do—and observed, "In the end, it's up to your own abilities and how you're able to make the time." A third participant spoke directly of using university committee assignments to gain respect. She notes that she is careful to contribute at least as much as other committee members. "I don't go to meetings and sit." Fewer subjects have enhanced their collegial relationships within the framework of performing research, but several undertook deliberate activities which achieved this result. One bibliographer became an active participant in a campus research institute, giving papers, attending seminars conducted by other participants, and developing relationships with other scholars in the institute. When he began to participate, a totally different relationship resulted. Another participant initiated a jointly authored book project with another faculty member; her coauthor is the first faculty member whose interactions with her have had a

The majority of subjects in this study are well integrated into the governance structure of the university and serve on universitywide committees, the faculty senate, or senate committees.

collegial tone. A librarian who earned a Ph.D. midcareer observed that she has been taken more seriously since she received the Ph.D.

Finally, a long history at an institution was credited by some subjects for their acceptance as colleagues. One observed that the relationships get better as she gets older, while several noted, "It's a matter of who they know." Another concluded, "Professional respect has built up over time; now we know each other."

Attitude—The Basis for Acceptance

Half of the subjects indicated that interests in students, teaching, and the learning environment were commonalities that enhanced the collegial atmosphere between librarians and other faculty. Several subject specialists spoke of shared experiences—going to the same meetings, knowing the same people, sharing the same "in" experiences—and placed a premium on this common ground. However, the two themes that elicited extended comment from participants are the mutual value placed on research and the confidence an individual librarian brings to the relationship.

Those subjects who hold Ph.D.s have certified research interests. As one observed, the faculty know he places a similar value on scholarship and notes that many librarians do not share this commitment to scholarship and ideas. Of the study participants who spoke of their own research interests, all hold doctorates. Others, however, referred to their interest in their faculty colleagues' research. Some talk to people about their research and what they are doing. Several subjects spoke of their high regard for what faculty are doing. Another expanded on this theme:

> I have bought into the university and the pursuit of knowledge, so I am dealing as an equal. If you don't buy into that pursuit, you are an outsider. . . . Some librarians fall into this trap.

It is notable that every interview subject in this study expressed confidence in his or her role, contributions, or acceptance by colleagues on the teaching faculty. Many regard themselves as experts on information access and the information retrieval process and expect to command respect on that basis. One subject observed that "her faculty" realize that she can be an adjunct in their research; they recognize her expertise. Another commented: "If librarians have a healthy attitude toward themselves . . . what they're doing is important; it is part of the scholarly world."

Several participants noted that librarians must participate in relationships with other faculty *on an equal basis.*

A few respondents remarked about the timidity many librarians bring to their relationships with other faculty. It was observed, "Too many librarians are timid souls; they wring their hands and want people to recognize them." Another pointed to the "motivational or psychological issue"—the degree of comfort in making overtures to faculty—and noted that those librarians who can get over this have a reasonable chance to succeed at a collegial relationship.

Several participants noted that librarians must participate in relationships with other faculty *on an equal basis*. As one subject observed, "We are equal. They represent a discipline, and I represent a discipline—a mutual type of thing." Another remarked, "We don't act as peers—a big mistake. I have interacted as an equal from day one. Most librarians just don't have the confidence."

Learning to Be a Faculty Member

In response to the question, "How did you learn to be a faculty member?" five subjects indicated that they had been raised in a faculty family, and three were former teaching faculty members themselves. Those who were faculty children commented that the faculty role was comfortable and familiar, that they had always been comfortable in a faculty atmosphere—"I always knew," and "Is

there any other life?" Moreover, they were never intimidated: "No one in the academic world scares me; there is no one to be in awe of," or, "Having been raised in it is a great leveler; it takes undue respect out of it."

For those not fortunate enough to have been raised in an academic family, a mentor or a model was considered to be significant. As one subject described it: "I had a great mentor, a model, who did everything to facilitate this role. She [the director] pushed, expected, and helped me to get on committees." Another worked under the direction of a department head who was convinced of the importance of contact with faculty; he modeled techniques for doing it, which was very useful. A third formed mentoring relationships with more senior librarians in her first library position. Finally, in the experience of some subjects, more recent library directors have mentored library faculty and, thus, were credited with fostering collegial relationships between teaching faculty and their colleagues in the library.

The only interview subjects whose library school experience seemed relevant to their learning to be library faculty members were those who held Ph.D.s before going to library school. Those librarians all reported noting the scholarly activity of their library school professors and learning something about scholarship from the experience. All other subjects reported that library school—unlike the academic preparation for faculty in other disciplines—was irrelevant.

SUMMARY AND CONCLUSIONS

The librarians interviewed for this study indicated that considerable common ground exists between librarians and their faculty colleagues. A significant number define these shared values in terms of teaching and the learning environment. "We are all interested in students," or "We share a concern about the total experience for the student," are representative comments. Others—nearly half—find common values in research and scholarship, whether by the shared experience of performing research or by showing a high regard for the work faculty researchers do. Most of these mature librarians have become well integrated into their university's governance structure, aided by the specified representation required by faculty status and the fact that they know a significant number of faculty throughout the university. Committee service not dictated by requirements that the library be represented was less frequent. In carrying out committee responsibilities, developing a reputation for effective performance is regarded as essential in fostering collegiality.

The only interview subjects whose library school experience seemed relevant to their learning to be library faculty members were those who held Ph.D.s before going to library school.

The presence of a supportive library administration, effective models, and colleagues who acted as mentors—all these factors were helpful to some librarians both for learning to be a faculty member and to gain access to opportunities for campus involvement. Self-confidence in the librarian role, knowing people and being known, and overcoming the timidity factor—all point to the importance of "assuming" an outgoing personality to earn acceptance as a colleague of other faculty.

The primary issue examined in studies of librarians' professionalism—authority as a librarian—did not enter into these librarians' quest for acceptance as faculty colleagues. In fact, when the interview subjects spoke of commanding respect, they clearly meant the mutual respect of collegiality, rather than the respect a client has for a professional.

RECOMMENDATIONS FOR FURTHER STUDY

The participants of this study have demonstrated that performing the role of librarian can be used to establish collegial relationships with other faculty when a librarian brings a collegial atti-

tude to the interaction. In addition, a significant number, by volunteering, have exploited campus governance opportunities fully for the same purpose. A wide variety of other activities that were utilized—service on dissertation committees, acting as peer reviewers, participating in research seminars, serving on nonlibrary search committees—suggests avenues for librarians to broaden their collegial relationships. The ACRL Professional Liaison Committee could perform a service by identifying and publicizing more vehicles that academic librarians have used to establish the desired collegial relationships.

An appreciation for the role of scholarship in the university and the development of personal research interests were underrepresented in the comments of these mature librarians, even though about half of the subjects identified scholarship as a shared value. Working with the ACRL Research Committee, the Professional Liaison Committee should develop techniques to foster appreciation of these related issues as a contribution to better collegial relations.

Modeling and mentoring activities were identified as positive factors in the development of mature librarians. Libraries in which mentoring is taken seriously should be identified and studied for elements that can be generalized.

Individual librarians operating within a university library demonstrably can gain acceptance of colleagues in other disciplines. The carryover to the library as a whole or to the entire group of librarians should be investigated.

REFERENCES AND NOTES

1. *ALA Handbook of Organization 1991/1992* (Chicago: ALA, 1991), 47.
2. Association of College and Research Libraries, Academic Status Committee, "Standards for Faculty Status for College and University Librarians," *College & Research Libraries News* 53 (May 1992): 317–18.
3. See Janet Krompart, "Researching Faculty Status: A Selective Annotated Bibliography," *College & Research Libraries* 53 (Sept. 1992): 439–49.
4. W. Bede Mitchell and Bruce Morton, "On Becoming FacultyLibrarians: Acculturation Problems and Remedies," *College & Research Libraries* 53 (Sept. 1992): 379–92.
5. Larry R. Oberg, Mary Kay Schleiter, and Michael Van Houten, "Faculty Perceptions of Librarians at Albion College: Status, Role, Contribution, and Contacts," *College & Research Libraries* 50 (Mar. 1989): 223.

Cooperative Collection Development at the Research Triangle University Libraries: A Model for the Nation

Patricia Buck Dominguez and Luke Swindler

The cooperative collection development programs of the Research Triangle university libraries are the oldest and most successful in North America. Analyzing their evolution and expansion over six decades, the authors identify the rationale and principles of successful cooperative collection development, the types of cooperation that work best for different subjects and kinds of materials, and the factors that promote cooperation over the long term.

Cooperative collection development is the flag, motherhood, and apple pie of librarianship. Everyone is for it.[1] But while library literature is full of attempts to describe what it is or explain how to do some aspect of it, there are no critical analyses of cooperation based on long-term case studies that document what has worked and why. The history of cooperation at the libraries of Duke University, North Carolina State University (NCSU), and the University of North Carolina at Chapel Hill (UNC–CH), which together form the Research Triangle university libraries, provides the opportunity for just such a study.

Librarians at Duke University, NCSU, and UNC–CH have cooperated for more than half a century. Recent statistics attest to the success of their efforts. Comparisons of nearly two million records in their shared online catalog revealed that 76% of the titles were found on only one campus, and only 7% were common to all three universities.[2] Applying this percentage to their combined holdings of 9,536,556 volumes in the 1991/92 *ARL Statistics*, the number of unique volumes available to researchers at the three Research Triangle universities was 7,247,783—a figure probably exceeded only by the libraries at Harvard, Yale, Illinois, and the University of California–Berkeley.

Reflecting not only on the unique holdings but the coordinated, interdependent, and interlocked nature of the collections, a former provost at UNC—CH stated that the cooperative collection development effort of the Triangle Research Libraries Network (TRLN), the umbrella organization for library cooperation among the three universities, was the finest example of planning on campus.[3] In congressional testimony on federal support for libraries, the Research Triangle consortium was the only example of successful cooperative collection development cited.[4] Why have observers singled

Patricia Buck Dominguez is Humanities Bibliographer and Luke Swindler is Social Sciences Bibliographer in the Collection Development Department, Davis Library, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina 27599–3918. Their e-mail addresses are pat_dominguez@unc.edu and luke_swindler@unc.edu. *They wish to thank John Abbott, Florence Blakely, Gary Byrd, Ginny Gilbert, James Govan, Joe Hewitt, John Rutledge, and John Shipman for reading and commenting on earlier versions of this article.*

out TRLN for special praise, and how has it managed to become the oldest and most successful large-scale cooperative collection development program among North American universities?[5]

Throughout six decades of trial and error, administrators, faculty, and librarians at Duke, NCSU, and UNC—CH have sought to identify the rationale and principles of effective cooperative collection development, the types of cooperation that work best for different subjects and kinds of materials, and the factors that contribute to successful cooperation over the long term. The lessons they have learned from their attempts to address these issues can help others around the country create effective cooperative collection development programs.

THE EARLY 1930s: SETTING THE STAGE

Historical and economic circumstances played a crucial role in the development of cooperation between Duke and UNC by limiting the options available to administrators, faculty, and librarians.[6] After the Civil War, the South was the poorest region in the nation. At the turn of the century, North Carolina, which had still not recovered from the Civil War, was the poorest state in the region.[7] Thirty years later, the Depression was reversing much of the economic progress the state had made since then.

Libraries reflected the state's economic fortunes. In 1901 the library at UNC, the largest academic library in the state, had one librarian, two student assistants, and about 40,000 volumes.[8] A generation later, although a basic research library existed at UNC and the nation's largest tobacco fortune was building another at nearby Duke, neither institution possessed a great collection. Indeed, both libraries suffered budget reductions during the Depression, and a federal report issued in 1937 ranked the Chapel Hill-Durham area only thirty-fourth among the seventy-seven urban areas having library collections in excess of 500,000 volumes.[9]

The second factor leading to cooperation was the ability of administrators, faculty, and librarians to see beyond the limitations of their circumstances. Frank Porter Graham, president of UNC, and William P. Few, president of Duke, knew that they did not have the resources to build great universities in the conventional way, but they shared the New South vision of uplifting the region through planning and cooperation.[10]

To achieve their ambitions for their universities and the region, Graham and Few were willing to entertain unorthodox solutions to the problems they faced. In 1933 they formed the Joint Committee on Intellectual Cooperation to determine how the two institutions could enhance and extend their resources. Two years later the group issued *A Program of Cooperation*, a remarkable document that asserted:

> The University of North Carolina and Duke University are confronted with obligations and opportunities which they can meet adequately only through a program of cooperative endeavor.[11]

Within the context of university cooperation, the presidents perceived the importance of library cooperation:

> Although these two libraries are already the largest in the Southeastern States, neither has nor will be able to provide for a long time to come the materials for study and research which are to be found in the great libraries of the North and East. The opportunity of supplementing the resources of each library by those of the other, offered by the physical proximity of the two institutions, is one of which it is proposed to take advantage.[12]

This statement provided the philosophical framework for library cooperation.

Just as the presidents provided the vision for cooperation at the university level, library directors Robert Downs (UNC) and Harvie Branscomb (Duke) provided leadership for library cooperation. Both men were willing to risk a cooperative approach to building library collections, despite the lack of models for doing so, because of the existence of a universitywide context favorable to cooperation. For the same reason, faculty

on both campuses were willing to suggest and support cooperative projects.

The third factor that encouraged cooperation was the availability of outside funds. The General Education Board (GEB), a philanthropic agency that John D. Rockefeller endowed, played a crucial role. In the early 1930s it made the improvement of higher education in the South, particularly library and laboratory facilities, a prime objective.[13] Influenced by sociologist Howard Odum and the Chapel Hill regionalists whose research it financed, the GEB hoped that funds spent enhancing colleges and universities would translate into improved economic well-being and eventual rehabilitation of the region.[14]

The *Program of Cooperation* echoed those sentiments and ambitions. Memos between administrators, faculty, and librarians at Duke and UNC mentioned the GEB, highlighted the opportunities it offered the two institutions "to assume leadership in this region," and expressed the fear that "if these two institutions can't get together, they [the GEB] seem to be seeking other institutions that might do this and their policy may be to assist some other institution more thoroughly than they would either Duke or Carolina separately."[15] To a large extent, then, library cooperation came into being because a funding agency encouraged it tangibly.[16]

The fourth factor leading to cooperative collection development was shared bibliographic information about the collections and enhanced access to the materials. The GEB underwrote an exchange program for main entry cards in 1934. This bibliographic information was essential to the success of the cooperative programs. Indeed, until faculty and librarians knew what both libraries held, cooperation could not work. Special inter-library loan arrangements (including daily delivery service) and the extension of full library privileges to faculty and advanced graduate students at the other institution, in place by 1935, also facilitated cooperation.[17]

Interinstitutional cooperation therefore began because visionary individuals in positions of authority saw it as a way to surmount dismal economic circumstances and enable their institutions to compete successfully with richer universities. Librarians, nurtured by grant funding, needed bibliographic and physical access to each others' holdings in order to cooperate in building collections. Only when all these factors came together could cooperative collection development programs begin.

THE LATE 1930s: SEARCHING FOR WAYS TO COOPERATE

Library cooperation began in 1934, when the GEB granted Duke and UNC $12,500 for a joint catalog that "facilitates the interchange of books and makes possible a co-ordinated development of future book collections."[18] Cooperative collection development dates from the following year.

With the stage set, Downs and Branscomb began to address the major issues of cooperative collection development: What are the rationale and principles of cooperation? How do libraries cooperate? Which academic disciplines, subjects, and types of materials make good candidates for cooperation? How do librarians, faculty, and administrators work together to develop effective programs?

Following the themes outlined in *A Program of Cooperation*, the library directors agreed that the goals of cooperative collection development were to achieve excellence and serve users by providing resources for research that the libraries could not afford otherwise, rather than to save money.[19] They planned to reach these goals by creating coordinated, interdependent, and interlocked collections that minimized the unnecessary duplication of materials.[20]

After determining the goals and objectives of cooperation, Downs and Branscomb developed five principles of cooperation.[21] In the first place, they agreed that cooperation would emphasize what a library, acting in self-interest, could contribute to cooperation. To this end they encouraged each institution to build on the strengths of its academic programs and library collections. Sec-

ond, librarians did not restrict what their cooperative partners could acquire.[22] As Downs later observed, "Libraries should not be asked to give up anything but rather to assume positive responsibilities and receive direct benefits."[23]

Third, the directors, who were sensitive to the potential use of items, decided to limit cooperation to materials needed for "graduate and research activities." They excluded instructional titles, whether for undergraduates or students in the professional schools, and considered duplication of basic texts, sets, and periodicals desirable. Fourth, both agreed to maximize the number of unique research materials by avoiding unnecessary duplication. Finally, the directors recognized that if agreements were to be successful, they needed to be flexible and allow for adjustment and expansion.[24]

Regarding the question of which subjects would lend themselves to cooperative collection development, members of the Committee on Intellectual Cooperation suggested two options:

> (1) concentration in each library of materials dealing with specialized problems or fields of knowledge in which one institution is primarily interested, and (2) subdivision of fields in which both institutions are interested.[25]

In addition, they asked librarians to avoid duplicating specialized research materials, particularly expensive titles, large sets, and serials, where one copy in the area was sufficient, and to divide collecting responsibility for state, federal, and foreign documents.[26]

Downs and Branscomb lost no time applying to the GEB for a cooperative collection development grant. In 1935 they received $50,000, which they divided equally between the two institutions.

Although the *Program of Cooperation* presented two strategies for cooperation, the librarians decided that in this grant they would focus on materials required by major disciplines that met the following criteria:

> (1) Strong departments in both institutions should be chosen both because such departments presumably are doing highly effective work, and because the problem of coordinating the work of the two Universities must be solved in such areas. (2) The departments must be ones which have shown an interest in and ability to correlate their programs with those in the other University. (3) The departments should be those which are believed to be of special importance to this region in an economic, social, or cultural direction.[27]

The disciplines they selected, following the recommendations of departmental chairmen at both universities, were botany, zoology, chemistry, physics, English, sociology, and economics. The librarians hoped that "these departments will become an illustration and example to others in the two institutions, and the habit of mutual dependence on the other University induced by the active use of a considerable body of materials in the other library will forward the whole movement of cooperation." Downs and Branscomb expected success in these key areas to lead to successful cooperation overall. They may also have recognized that the best strategy for winning a grant from the GEB, given its emphasis on uplifting the South, was to select disciplines "of special importance to this region in an economic, social, or cultural direction."[28]

For this initial attempt librarians and faculty stressed two approaches. First, they divided materials on an ad hoc basis. The decision was "more or less arbitrary as regards basic sets, periodical files, and other material applying to the field as a whole." Second, they made the first of many efforts to cooperate systematically on academic disciplines. In this case they divided responsibility for books, serials, and other library materials by the major subfields of each of these disciplines according to faculty research interests.[29]

Faculty and librarians assigned specific subfields to each library. For example, in chemistry Duke took responsibility for biochemistry, paper and cellulose chemistry, agricultural chemistry (particularly

tobacco), and food chemistry; UNC emphasized chemical engineering, petroleum products, electrochemistry, and the history of chemistry. For English, they developed complicated divisions based on chronological periods, authors, and genres.[30]

This attempt at the systematic division of responsibility for the publications of major disciplines seemed to make sense at the time. Faculty and librarians may have chosen this approach because they conceived of academic disciplines in terms of their subfields. However, the systematic division of responsibility for books, serials, and other library materials by major subfields proved impossible, because it weakened library support for the discipline as a whole and jeopardized scholars' ability to do research in their specialties. In addition faculty interests changed over time, further undermining the stability of subfields as units of cooperative collection development. Therefore, this type of systematic cooperation did not survive the grant. Indeed, it apparently provided a model of how *not* to cooperate, because librarians never divided traditional disciplines by their major subfields again.

Although this division of responsibility did not provide a long-term model for cooperation, the grant was successful in other ways. Librarians learned they could cooperate on an ad hoc basis for specialized and costly titles, such as multivolume sets, long periodical runs, and newspaper backfiles. Indeed, ad hoc cooperation has been one of the most successful forms of cooperative collection development over the decades and has been responsible for extending the number of unique holdings in the TRLN libraries significantly.

The grant also fostered a cooperative mentality. As Downs and Branscomb wrote, "There is now general acceptance of the idea of cooperative collections, and it is becoming general procedure to limit duplication of rare and expensive items in all fields."[31] Cooperative collection development efforts continued and multiplied because librarians became committed to cooperation and kept searching for ways to expand it. Their efforts, in turn, succeeded because faculty accepted cooperation as a given.

Building on the momentum of this two-year grant, librarians next considered the cooperative acquisition of foreign, federal, and state documents. Although faculty and librarians had based the cooperative proposals funded by the GEB on faculty research interests, librarians, acting on their own, proposed a systematic division of government documents in 1937. Downs suggested to Branscomb that foreign documents should be concentrated at Duke, "because of the excellent start you have made in this field." Both libraries were to remain depositories for current federal publications (with librarians at UNC taking responsibility for filling in gaps of older materials). Because of the strength of UNC's holdings, its librarians would assume responsibility for state documents.[32]

But the faculty disagreed. They produced a report arguing that because researchers at both institutions were engaged in the study of both local and foreign problems, "a division of function can never be made which will allocate to one the responsibility for domestic and to the other foreign, it is the belief of this Council that a division of library materials on this basis should not be attempted. We believe that a more satisfactory plan would be to endeavor to divide each area between the two libraries."[33] The faculty version prevailed. Ultimately, faculty and librarians put into operation a more complex plan that divided responsibility systematically according to geography, subject (which often corresponded to issuing agency), and publishing format, such as legislative journals.[34]

The initial proposal, faculty reaction, and final agreement revealed the importance of basing cooperative agreements on academic programs and including faculty in their development. It also marked the first time that faculty and librarians divided collecting responsibilities geographically, an approach that played a major role in later cooperative efforts.

The agreements for government documents worked well. Their success de-

monstrated that systematic cooperation for materials of interest to faculty in many departments worked, if the items were not central to their teaching and research specialties and were distinct in format or method of acquisition. Although modified and expanded over the decades, cooperative agreements for government publications continue to be a major focus of cooperation among the Research Triangle university libraries.

Beginning in the late 1930s, Duke and UNC received a series of grants from the North Carolina Division of Cooperation in Education and Race Relations to buy library materials on "all aspects of Negro history, literature, education, economic and social conditions, religion, health, etc." Within a few years these funds created a combined African-American collection of 10,000 volumes, with almost no duplication except for recent books that would be in demand on both campuses.[35] The grants demonstrated that new areas of interdisciplinary research—even those of special interest to faculty at both universities—could be fruitful areas of cooperation. Librarians included interdisciplinary cooperation in their next grant proposal, perhaps because of their success here.

In their application to the GEB in 1938, librarians recognized the tentative and experimental nature of the original cooperative agreements, the necessity of winning the support of all parties affected, and the importance of avoiding the appearance of arbitrariness. At the same time the application showed that they had assimilated important lessons from their earlier grant and the agreements for government documents. In their search for a systematic model of cooperation, librarians shifted their emphasis from disciplines that were strong at both universities to subjects representing unique academic and collection strengths. For other subjects they proposed cooperating on an ad hoc basis.[36]

On the basis of unique academic strengths, UNC took responsibility for geology, music, Indo-European linguistics, library science, and Romance languages. Duke concentrated on forestry, fine arts, mathematics, religion, and Oriental history, philosophy, and literature. Where both supported strong programs, librarians asked for funds to develop collections in fields involving more than one academic discipline. They chose social history, which was of interest to departments of sociology, economics, and history; political science, which included international law, and federal, state, and local government; and classical studies, which included history, literature, and art. The multidisciplinary nature of these fields represented a different approach from the previous grant, which had focused on traditional academic disciplines. Finally, building on their earlier successes, Duke and UNC proposed using grant funds to continue cooperation in government documents, bibliography, and newspapers, which were of interest to the research community as a whole.[37] Although Duke and UNC did not receive this grant, the hope of securing outside funding provided librarians with the impetus to develop approaches that would form the basis of future cooperation.

By the end of the decade, librarians could look back on their efforts with a sense of accomplishment. They had established the rationale and principles of cooperation that continue to this day. They had identified the two major types of cooperation: ad hoc and systematic cooperation. Librarians had successfully applied the ad hoc approach to costly items and materials for special collections. They had systematically divided books, serials, and other library materials of interest to many disciplines that were characterized by distinctive format or method of acquisition, particularly government documents and newspapers. In addition, faculty and librarians enjoyed enhanced bibliographic and physical access to each others' collections and had developed a spirit of cooperation that would motivate them to maintain existing programs and create new ones.

The librarians were aware, however, of what they had not yet accomplished. There was little intercampus communica-

tion, no ongoing coordinated growth of the collections, and they therefore had not built a well-rounded collection to be used by the whole region.[38] In addition librarians had not yet developed a systematic approach to cooperation for specific subjects over the long term. The creation of that model would be the achievement of the next decade.

THE 1940s: CREATING THE AREA STUDIES MODEL

In the 1940s an emerging interdisciplinary field suggested a systematic way to cooperate on a subject. As the Allies suffered reverses during the early part of the Second World War, Sturgis E. Leavitt, professor of Spanish at UNC, believed that "the hope of civilization lies in the New World. Cultural relations between the Americas are therefore more important now than ever before."[39] He, his colleagues, and librarians at Duke and UNC who were interested in this developing field, proposed expanding cooperative collection development to cover research materials from and about Latin America. They also suggested including a third institution, Tulane University, which had already developed strong holdings on the area.[40]

On the basis of faculty interests and library holdings, faculty and librarians initially agreed to divide collecting responsibility by subject. Tulane would cover Caribbean archaeology, Indian (Native American) languages, *modernismo*, and the influence of U. S. literature on Latin American literature. Duke would collect the cultural history of the colonial period and Brazilian studies. UNC, for its part, would acquire materials on bibliography, library science, Spanish American languages, Spanish American literature in the United States, folklore, constitutional and political history, the eighteenth century, and the *cabildo*.

Of greater importance, however, were the provisions for each university to assume responsibilities based on geography, which both faculty and librarians considered "logical and fair." Building on the strengths of their collections, Tulane took the Middle American region, including Cuba and the Antilles; Duke emphasized Brazil, Ecuador, Peru, Bolivia, and Colombia; while UNC accepted responsibility for Chile, Paraguay, Argentina, and Uruguay.[41]

In 1940 the Rockefeller Foundation gave Duke, UNC, and Tulane a grant of $75,000 ($25,000 each) to be spent for Latin American studies over a five-year period.[42] When faculty and librarians came to work out policy and procedures for implementing the grant, they abandoned subject arrangements in favor of geographical divisions. In fact, the only mention of subject divisions was that "North Carolina will develop its collection of folklore without geographic restrictions."[43] The geographic model of cooperation eventually became preeminent among cooperative strategies for dividing foreign area studies.

There are many explanations for the continuing success of this paradigm. The simplicity of administering the geographic divisions was a major attraction. Faculty and librarians found it easy to remember such clean divisions.

Another reason for success was the faculty's realization that neither institution had resources to build major collections for a new area of research. They saw cooperation as the best way to acquire a wide range of materials in an emerging field the libraries could not afford to support otherwise. The continuing importance of Latin American studies over many decades ensured the survival of these cooperative agreements, even during times of limited funding.

Perhaps the major reason for success, however, was inherent in the newness and interdisciplinary nature of Latin American studies. The materials were important to faculty and students in many departments, yet no academic department had a vested interest in the area that corresponded to a standard disciplinary subfield. As a consequence, librarians had freedom to interweave the collections, creating a coordinated whole. They anticipated this goal from the start: "Subject interests of faculty . . . which reach across the geographical line of di-

vision will be met by the agreement that each library, in buying in its allotted field, will consider requests from the other faculty on the same basis as requests from its own."[44] They also instituted a liberal interlibrary loan policy to mitigate any hardships users might experience as a result of this geographic division of responsibility.[45]

Finally, cooperative collection development for Latin America worked not only because it had long-term faculty backing but also because library administrators hired staff to implement it. The first provision for spending the Rockefeller money stated that "each institution will appoint a coordinator who will act as the central agent for his university. Through him all matters affecting the individual institution and the cooperating institutions will be cleared."[46] As part of the agreement, UNC sought "to employ a library assistant . . . [to] facilitate the handling of exchanges, of purchases from South American dealers, and in coordinating the work with the other two cooperating libraries."[47] Later, UNC hired a Latin American bibliographer, the first full-time collection development officer with specific subject responsibilities in the Research Triangle university libraries.

While developing the cooperative model for Latin America, librarians at Duke and UNC continued to search for strategies that would work for other subjects. As part of their efforts, they divided collecting responsibility for a number of fields in the early 1940s. Many of these subjects represented unique academic strengths. Duke, for example, had the only programs in religion, medicine, and forestry, while UNC had unique programs in library science, public health, geology, folklore, and linguistics. Other divisions were based on the strengths of library collections. Duke had exceptional holdings of American literature, for example, while UNC had a special collection of North Caroliniana. A few of these subjects represented the librarians' continuing efforts to find a way to divide subject disciplines of interest to both institutions. In such cases they did not assign responsibility for subfields based on faculty interests, as they had in the 1930s, but on broader categories such as early German literature (UNC) and late German literature (Duke).[48]

Librarians continued the systematic division of responsibility for publications with distinct formats and methods of acquisition that were of interest to faculty in many departments or the academic community as a whole. These materials included state government documents and the catalogs and annual reports of colleges and universities. For documents they based cooperative agreements on geography, subject/issuing agency, and format. For colleges and universities, they used issuing agency. Duke collected catalogs and annual reports from private institutions; UNC, those from public ones.[49]

The 1940s were extraordinarily successful. During this decade, faculty and librarians at Duke and UNC developed one of the major types of systematic cooperation, the area studies approach. Librarians also learned that they could continue to build complementary holdings based on unique academic or collection strengths. In addition they continued agreements for many types of materials of general interest that were distinct in format or method of acquisition. Finally, these years demonstrated that the subjects and kinds of materials identified in the previous decade as good candidates for ad hoc cooperation were indeed appropriate choices and worked over the long term.

A series of grants from the Carnegie Corporation in the early 1940s helped librarians maintain and solidify these cooperative collection development agreements. They used these funds not only to honor Duke and UNC faculty requests, as they had done with the earlier Rockefeller grants for Latin America, but to meet the needs of faculty throughout the region within their respective areas of responsibility.[50]

THE 1950s: EXTENDING GENERAL COOPERATION

When grants for cooperative collection development ended in the late 1940s

and no new outside funds replaced them, enthusiasm for new cooperative initiatives waned as well, although existing forms of cooperation continued.[51] Then, in 1953, the presidents of Duke and the UNC system (which included the State Agricultural and Mechanical College at Raleigh, later NCSU, the Woman's College at Greensboro, and the Chapel Hill campus) appointed faculty and librarians from each of their institutions to an Inter-University Committee on Library Cooperation. Their purpose was to reinvigorate and expand the cooperative programs.[52] Representatives from the State Library joined them soon after.

Librarians from the five institutions tried to coordinate their acquisitions policies.[53] They contributed information about their holdings to union lists of periodicals and agreed to allow faculty and graduate students to borrow books directly from each other.[54] Staff from the four universities also agreed to meet regularly to implement the policies of the Inter-University Committee.[55]

Despite these initiatives with nearby libraries, only Duke and the Chapel Hill campus were involved in cooperative collection development programs. In 1956 librarians at the two institutions codified their existing agreements. The results, which were remarkably similar to those existing in the early 1940s, underscored the success of the original principles and types of cooperation over two decades.

Librarians retained a systematic division of responsibility for government documents but revised specific components of the agreements. Because "UNC has since developed more aggressive and extensive collecting," it took responsibility for all state documents. Duke, which had recently established a Commonwealth Studies Center, agreed to be responsible for Canadian government documents, with the exception of geological publications (which UNC continued to collect comprehensively).[56] This division is remarkably similar to the one the librarians proposed in the 1930s, but which faculty did not accept, because it seemed too arbitrary and was based only on collection strengths. This time, however, faculty could accept such a division, because it matched academic programs as well as library collections.

There were also some new initiatives. Librarians divided depository responsibility for the publications of various international agencies. In addition they attempted to divide responsibility for census statistics and ethnographic publications geographically, following the successful model for Latin American studies. Duke was to collect material for the Far East west to India, the British Isles and the Commonwealth (again building on its Commonwealth Studies Center), its Latin American countries, and the USSR. UNC agreed to collect titles from the Near East (west of India to Europe), its Latin American countries, Africa, and the areas of Europe not covered by Duke.[57] These agreements were superseded by more comprehensive arrangements, as area studies gained in importance in the 1960s.

The rapid growth of microform publishing in the 1950s presented librarians with a financial challenge that they turned into a major cooperative success. They coordinated the purchase of major microform sets on an ad hoc basis to reflect faculty interests and collection strengths. In a few cases, such as the *Landmarks of Science*, they shared the cost of a set and placed it in the most appropriate library. The cumulative results of these cooperative efforts became evident when the TRLN union list of microform collections appeared in 1986. Only 3 percent of its nearly 1,200 entries represented materials held at more than one institution, and only about 1 percent was held at all three.

Librarians' attempts to cooperate sometimes ran afoul of the faculty's need for materials. Faculty at Duke vetoed a proposal to divide responsibility for expensive foreign government serials, in this case, the British sessional papers and the French *Journal Officiel*. They said they needed both subscriptions on their own campus. But Gertrude Merritt, chief of the Processing Division at Duke, over-

ruled them. She urged Harry Bergholz, the chief bibliographer at UNC, to continue subscribing to the *Journal Officiel*, while Duke subscribed to the sessional papers.[58]

This incident illustrates one of the major dilemmas of cooperative collection development. Is it better to allocate resources to meet cooperative responsibilities and thereby build a more comprehensive joint collection, or to satisfy immediate faculty needs by giving priority to local needs? In this case librarians were able to realize broader cooperative objectives. In other instances, faculty pressure has been so strong that librarians have had to duplicate expensive materials. On the whole, however, faculty have been willing to support cooperation.

THE 1960s: EXTENDING AREA STUDIES COOPERATION

The growth of national programs for cooperative acquisitions in the 1960s led librarians to review existing agreements between Duke and UNC. In particular they weighed their obligations to continue local cooperative programs against participation in national endeavors, such as the Farmington Plan.

In 1961 Benjamin Powell, university librarian at Duke, wrote to Jerrold Orne, his counterpart at UNC, asking him whether the two libraries should jettison their cooperative agreement for Latin America in favor of a national program. According to their existing agreement, Duke and UNC covered all the Latin American countries selectively. Under the Farmington Plan, they would work with only a few countries, but in greater depth, and rely on other libraries in the United States for research materials from other nations. Orne's response illustrated the value that librarians in the Research Triangle placed on their local arrangements:

> . . . I do believe that we both have, first, a responsibility for mutual accord on the division of fields in the Latin American countries closely tied to our teaching programs and, secondly, that any participation in a national program must be related to our individual responsibilities first. . . . If what we do fits into the Farmington Plan, I will be happy to be named with it, but if it does not, I cannot be too much concerned.[59]

Duke and UNC did not participate in the Farmington Plan, which lacked roots in the participating institutions and ultimately withered away.[60] By contrast, the Duke/UNC cooperative program for Latin America met faculty needs at both universities and thrived. Indeed, librarians at Duke and UNC joined the Latin American Cooperative Acquisitions Program two years later, because they could build their national contribution on local cooperative agreements.[61] The different fates of these projects demonstrate the importance of the principle of self-interest as the foundation for cooperation. Cooperative ventures that do not grow out of the academic programs or collection strengths of individual institutions will not survive.

During the 1960s, new area studies programs came into existence at both universities. Faculty and student needs for materials from and about Africa, East Asia, Eastern Europe, and South Asia, in particular, strained available funds. In meeting these new demands for resources, librarians drew on their experience with a geographical division of Latin America as a model for successful cooperation.

Faculty developed a joint Duke/UNC-CH graduate program in Russian and East European history in the early 1960s. Librarians supported it by dividing responsibility for Russian and Soviet materials in the humanities and social sciences, while limiting the acquisitions of books and serials from other East European countries to titles related to Russian studies.[62] Later, they divided responsibility for the Slavic countries of Eastern Europe. Librarians at Duke took responsibility for Polish materials; their colleagues at UNC did the same for Czech publications; while librarians at the University of Virginia agreed to cover titles in South Slavic languages for certain subjects.

About the same time, librarians formalized agreements for Africa. As in the

case of Latin America, they based their cooperative responsibility on academic and collection strengths. Because Duke had supported a Commonwealth studies program since the mid-1950s and its libraries held many publications from these countries, librarians there took responsibility for the English-speaking areas of Africa. Librarians at UNC complemented Duke's efforts by collecting specialized materials for the Arab north and some of the French-speaking areas of sub-Saharan Africa. Eventually, they assumed responsibility for nearly all the non-Anglophone countries of the continent in order to divide costs equitably.[63]

By the end of the decade, librarians began to cooperate on Asian materials. Here again the geographic model prevailed. Although they decided that both institutions would acquire titles to support East Asian studies in Western languages, librarians divided responsibility for materials in Chinese and Japanese.[64] Eventually, librarians at UNC accepted responsibility for acquiring and processing titles in Chinese, while those at Duke did the same for Japanese.

Librarians also formulated agreements for other areas of the world. Because of Duke's commitment to acquire Commonwealth materials and its large-scale participation in the PL-480 program, its librarians assumed responsibility for building research collections in South Asian studies and hired a South Asian bibliographer during this period.[65] Following the same logic, Duke's librarians eventually assumed responsibility for Australasia, Canada, and the English-speaking countries of the Pacific and West Indies. In response, librarians at UNC reduced their collecting of materials from all these Commonwealth countries to a basic level.

The geographical model of cooperation worked as well for these areas as it had for Latin America, and for the same reasons. One measure of the extent of the success of this model is evident in the latest union list of current foreign newspapers at Duke and UNC–CH, which dates from 1988. It revealed that only 21 percent of the 192 subscriptions were duplicates—and these tended to be heavily used items such as *Le Monde*. Moreover, the duplication rate drops to only 4 percent when West European newspapers are excluded.

THE 1970s: PROVIDING A STRUCTURE FOR COOPERATION

The decade began inauspiciously with minor elaborations and expansions of the agreements for area studies. This situation changed a few years later, when library administrators and staff created a new framework for cooperation, and outside agencies contributed major funding for cooperative projects.

In response to inflationary increases in serials prices and concern about whether collections could support research in the rapidly growing Research Triangle Park, university librarians James Govan, UNC–CH, and Connie Dunlap, Duke, appointed a committee to explore additional cooperative ventures.[66] The group soon invited librarians at NCSU to participate as full partners, and together they established the Triangle University Libraries Cooperation Committee (TULCC). Within a few years TULCC became the Triangle Research Libraries Network (TRLN), the current umbrella organization governing all cooperative endeavors, including collection development, bibliographic and physical access, and automation.[67]

These organizations provided a structure for regular communication that nurtured cooperation. During the course of increasingly frequent joint meetings, librarians became aware of shared interests and opportunities for cooperative action. As a consequence, they believed they were in a strong position to secure grants for collection development, bibliographic control, user studies, and program evaluations.[68]

Librarians received two cooperative collection development grants for $250,000 each from the Title II-C program; one during 1978/79 and another for 1980/81. They followed the successful cooperative models of the past in spending these funds. Librarians purchased materials in areas of unique aca-

demic and collection strengths. At UNC–CH, for example, they purchased specialized grammars and dictionaries to support research in linguistics. Librarians also made a number of ad hoc purchases of expensive titles, especially microform collections and newspaper and periodical backfiles. At NCSU, for example, they purchased the U.S. patents collection in microform. Finally, librarians at Duke and UNC–CH used the funds to enhance foreign area studies holdings, concentrating on the countries for which their institutions were responsible. Following the pattern of earlier cooperative collection development grants, these acquisitions represented unique additions to the consortium's collections.

The importance of these joint collection development grants for advancing cooperation between Duke, NCSU, and UNC–CH cannot be overstated. They led to a reaffirmation and refinement of previous agreements, the extension of cooperation to new areas, and the full integration of NCSU into the cooperative programs. They also helped make cooperation a central concern of collection development.

In order to implement the grants most effectively, a broad representation of selectors from all three campuses met quarterly to discuss their projects. In the past, cooperation had been the prerogative of library administrators. For the first time, as a result of these grants, librarians at the operational level began to participate directly in planning cooperative programs. By coincidence the TRLN institutions were installing new collection development staff around this time. The Title II-C grants enabled these individuals to develop a cooperative mentality that they now consider a normal—rather than exceptional—way of going about their collection development duties.

Finally, these grants enabled cooperation to proceed at a much faster pace than would have been possible otherwise. As John Shipman, university bibliographer at UNC–CH, pointed out in his final report on the second Title II-C grant, "there have been few periods during which [cooperative] activities have reached the level of those of the past three years."[69]

In order to guarantee continued cooperation, Shipman has allocated an average of $50,000 annually since the first Title II-C grant, solely for this purpose. These funds and others that have since become available for cooperative purchases have proved to be an excellent, continuing incentive. Over the past dozen years they have totaled close to a million dollars at UNC–CH alone.[70] The availability of this money heralded the intensification of cooperative collection development efforts during the next decade.

THE 1980s: EXPANDING COOPERATION TO CORE AREAS

The success of the cooperative programs for area studies and the enthusiasm generated by regular meetings led the bibliographers with major responsibility for Western Europe and the United States to develop cooperative programs for their areas of the world. Because materials published in Europe and North America are so central to the scholarly enterprise in this country, cooperative decisions for publications from these areas have been more complex.

The cooperative ventures for Western Europe took place during the middle of the decade. The bibliographers for Western Europe at UNC–CH and Duke planned cooperative programs for French regional history and German literature.[71]

The first program, established in 1984, covered French regional materials for the Triangle by assigning collecting responsibility based on a geographic division of France.[72] It applied only to lower priority titles. UNC–CH accepted responsibility for *départements* in the southern half of France and Paris; Duke, for the rest of the country.

A proposal to cooperate on German *belles lettres* also dated from that year. In order to expand the coverage of contemporary German literature, John Rutledge, bibliographer for Western European resources at UNC–CH, suggested that both

universities collect major authors, but that Duke acquire works by secondary authors whose names began with the letters A–L and Austrian writers, while UNC–CH took responsibility for those whose names began with M–Z and East German and Swiss writers.[73]

Both programs ran into problems. By the late 1980s, when funds could no longer cover higher priority titles in major fields, librarians stopped buying minor French regional histories. They revised the program, however, to divide responsibility for major regional publications along the same geographical lines.

The proposal to collect German authors cooperatively foundered when Helene Baumann, West European bibliographer at Duke, recognizing that Duke did not have the academic programs to justify such a broad scale of collecting, stated that her "primary mandate is to buy what Duke faculty and students need now and in the future." In the same letter she suggested building to strengths at each institution, with Duke buying specialized materials on German Baroque literature and German-Americana, because of the library's strong holdings in these areas, while UNC–CH emphasized German language, pedagogy, and folklore, which built on its academic and collection strengths. Rutledge agreed with her suggestions, and cooperation on this basis has worked.[74]

The success of the revised agreements for German language and literature and for French regional history once again revealed the importance of tying cooperation closely to academic programs and collection strengths rather than using abstract or arbitrary criteria. The experiment in French regional history also demonstrated that successful long-term cooperative programs cannot include subjects and materials that are too marginal to survive periods of tight funding.

During the late 1980s librarians made their first attempts to cooperate in a major way on materials related to the United States. The need to increase coverage of the American South arose when faculty and administrators at UNC–CH proposed an institute of Southern studies modeled on the foreign area studies programs. Realizing that UNC–CH did not have the funds to acquire all the relevant materials its researchers would need, librarians turned to their colleagues at Duke and NCSU for help. Their common goal was to build a joint collection for Southern studies that would become the major center for scholars and students undertaking comparative and multistate research on the region.

Because this initiative covered all subjects and formats and involved dozens of selectors in many disciplines at three universities, staff met together for two years to exchange information and discuss possible agreements for various subjects and formats. They learned the strengths and weaknesses of each other's collections, where they duplicated one another, and where there were gaps. Once again, the prospect of outside funding acted as a powerful incentive for them to agree on divisions of responsibility for materials from and about the region.

Several factors complicated the discussions. In the first place, for historical and cultural reasons librarians in the Research Triangle have always collected intensively on the region. In addition, faculty and students at the three institutions have had strong research interests in the South for decades. Whenever people care deeply about an area or subject, cooperative collection development agreements are more difficult to negotiate.

Logistically, cooperative agreements for the South presented a challenge, because most of the scholars doing research on the region were at UNC–CH. By contrast, Duke had the largest endowment with which to purchase Southern Americana, but fewer faculty studying the South. NCSU wanted to be involved, but was not sure how its emphases on science and technology would fit in with the usual cooperative focus on the social sciences and humanities.

The organization of the libraries, their selectors, and selection sources also

complicated the negotiations. Up to this point, formal cooperative agreements had been limited to collections in the main libraries. Because of the all-encompassing nature of collection development for Southern Americana, cooperative efforts had to involve librarians in both central and branch libraries. In developing these agreements, librarians needed to be sensitive to the complex relationships between faculty and staff in branch libraries and their lack of experience with cooperation.

The types of selectors at the three institutions further complicated the process. Until this project, cooperation had involved primarily full-time collection development officers who covered many fields. The scope of their responsibilities gave them a broad perspective on subjects, users, and overall library resources. They also had enough autonomy and authority to develop cooperative agreements. Most librarians involved with Southern Americana were part-time selectors responsible for one discipline. Because of the nature of their responsibilities, their perspectives, and their lack of experience with cooperation, they were also less aware of the ways it could benefit the larger community.

In addition, the sources that selectors used to identify items for acquisition had an impact on the materials they could cover. Librarians at UNC–CH and NCSU used Library of Congress proofslips and cataloging-in-publication forms, which encompass a broad array of materials related to the South and include many nontrade and other specialized titles. Duke's selectors relied primarily on vendor forms, book reviews, and user suggestions, which provided narrower coverage of the universe of publications, but met their collection development needs.

Finally, collecting priorities differed, resulting in varying commitments from each institution. Duke's selectors emphasized special collections—and had the endowed funds to afford such materials. NCSU's collection development officers preferred to concentrate on a limited number of academic and collection strengths, such as climatology, and a few formats, such as dissertations. Librarians at UNC–CH decided to focus on title-by-title selection, because of their ability to identify a broad spectrum of publications and because of the wide range of topics their faculty and students were researching.

The cooperative agreements for the American South that emerged from these meetings covered all subjects and formats and incorporated lessons librarians had learned over the decades. The divisions of responsibility met the priorities and needs of each institution and were therefore likely to continue. Where a university had strong or unique academic programs or collecting strengths, librarians based responsibilities on them. Because NCSU had a college of textiles, for example, librarians there assumed responsibility for materials on this topic. Their colleagues at UNC–CH took responsibility for folk music, because of that library's special collection of those materials.

Where more than one institution had academic or collection strengths, librarians divided responsibility on an ad hoc basis for expensive titles, such as microform sets, or systematically, by geography (for newspapers) or format. In the case of regional *belles lettres*, for example, Duke agreed to collect small press materials, while UNC–CH concentrated on little magazines. The agreements represented an equitable division of costs, as they had for the area studies programs.

More broadly, the cooperative agreements for Southern Americana revealed that librarians could cooperate in interdisciplinary areas of intense interest to many constituencies and do so even in times of financial austerity. Indeed, when programs are organic and build on academic programs and collection strengths, library priorities, and organizational structures, they are more likely to be successful in the long run than are arbitrary divisions of responsibility that ignore these crucial factors.

The success of the cooperative efforts for Southern Americana bore fruit in 1991/92 and 1992/93, when the three

libraries received two Title II-C grants of nearly $600,000 to acquire materials documenting the contemporary South. In particular, readers of the grant liked the cooperative nature, detailed planning, and comprehensiveness of the proposal. Librarians are expanding on this success by pursuing other grants for Southern Americana.

The ability of librarians to work together on cooperative projects for Western Europe and the American South was significantly enhanced by a shared online catalog that became operational mid-decade. Just as library cooperation in the 1930s owed its success to bibliographic and physical access to the collections, cooperative collection development in the 1980s advanced for similar reasons. A joint online union catalog made the resources of the three libraries available to all their users. During this period TRLN librarians also extended direct borrowing to undergraduates; expedited interlibrary borrowing, including the faxing of priority requests; and wrote special lending agreements for East Asian vernacular materials related to cooperative programs.

Advances in shared automation also made ad hoc cooperation possible for a wider range of materials by significantly lowering the cost of determining what each library held. These developments contributed to the increasing importance of collection strengths in influencing cooperation. Finally, they made library cooperation more acceptable to faculty, students, and librarians, and helped users and selectors view the TRLN collections as ultimately one.

THE 1990s: LOOKING TO THE FUTURE

Although the sciences had been part of the first cooperative collection development grant in 1935, they vanished almost immediately as an area of cooperative endeavor. For fifty years cooperation remained confined to the humanities and social sciences. In response to a lack of funding for acquisitions and the tremendous increases in the number and cost of scientific, technical, and medical serials in the mid-1980s, librarians took a renewed interest in cooperative collection development in the sciences. The pressures generated by these forces led selectors of scientific materials to begin meeting together in 1988.

Cooperation in the sciences received a further boost when administrators at NCSU, the university with the strongest focus on science and technology, appointed full-time science bibliographers with responsibilities for large subject clusters. Like the subject and area bibliographers for the humanities and social sciences, these full-time collection development officers assumed a leading role in planning and coordinating cooperation.

Science selectors have been supported in their efforts by the creation of a structure for incorporating specialized areas into the cooperative collection development organization. In order to broaden the scope of cooperation, the TRLN Collection Development Committee added roundtables covering nonprint materials and government documents in 1990. The following year it established a roundtable for medical, scientific, and technological fields. Now the science librarians have a forum and context to develop cooperative agreements.

Cooperative collection development in the sciences received additional encouragement from a two-year grant the Council on Library Resources (CLR) awarded TRLN in 1991. Under this grant administrators, faculty, and librarians are identifying the obstacles to cooperation in the sciences, determining how to overcome them through advanced technology, creating new organizational arrangements that ensure ongoing faculty participation, and discovering the kinds of strategies that might enable TRLN to provide advanced electronic information services.[75]

Another aspect of the CLR grant involves the development of administrative structures to formalize cooperative agreements. When the cooperative programs began in the 1930s, they were part of an overall institutional emphasis on intellectual cooperation. Since then, the

heads of the universities have continued to encourage library cooperation. *The Memorandum of Understanding* establishing TRLN bears the signatures of the universities' presidents and chancellors, and the provosts serve on its governing board. Although university administrators have supported all general cooperative agreements, librarians have never asked for—nor received—faculty or official administrative approval for specific cooperative collection development programs.

Over decades of cooperation librarians have run into problems on two counts because they lacked faculty involvement and formal administrative approval. In the first place, faculty have occasionally exerted pressure to change agreements that did not match their research needs. In the second place, administrators and faculty have established academic programs in areas that librarians had ceded to cooperating institutions and therefore could not support adequately. In such cases, university administrators would have been better served if they had been aware of the cooperative agreements and the economic consequences of abrogating them. TRLN librarians are using the CLR grant to create a way for faculty to participate in the development of cooperative agreements and for university administrators to endorse them formally. This type of faculty and administrative involvement should increase the likelihood of successful long-term cooperation.

The continuing proliferation and growing importance of interdisciplinary research throughout the academy presents librarians with many new opportunities for cooperation. Librarians at Duke, NCSU, and UNC–CH, for example, are using the CLR grant to discover if the recently created Center for World Environment and Sustainable Development—which involves over 150 faculty from all three Research Triangle universities—might provide a model for cooperative collection development in the sciences.

OBSERVATIONS ON SUCCESSFUL COOPERATION

For more than half a century librarians at the Research Triangle universities have wrestled with the key issues of cooperative collection development: Why should librarians cooperate? Which academic disciplines, subjects, and types of materials make good candidates for cooperation? How do librarians, faculty, and administrators work together to develop viable programs? In this article we have analyzed our efforts to answer these questions. We offer the following synthesis of the insights we have gained as a guide to help others create equally effective cooperative collection development programs.

Rationale for Cooperation

The goals of cooperative collection development are institutional excellence and enhanced service to users. Administrators, faculty, and staff rarely have the resources to support academic programs and library collections at the level they envision. They must therefore seek innovative approaches to advance local aspirations and meet local needs over the long term. Cooperative collection development is the best—and increasingly the only—way to realize these goals. If cooperation is to succeed, it must therefore emphasize institutional advancement and enhanced service to users rather than saving money.[76]

Librarians can achieve these goals by developing cooperative programs that build interlocked collections. This strategy extends the number of unique titles available to users. Materials that librarians at one institution cannot afford or think are inappropriate may be available from other members of the consortium. This approach also minimizes the unnecessary duplication of materials. By coordinating their collections, librarians do not need to duplicate specialized research materials and can use their funds to buy titles that are more central to academic programs and collection strengths.

The resulting interdependent collections provide a breadth and depth of coverage that would be impossible for individual institutions to achieve on their own. Eventually, cooperating libraries become resources both for their

institutions and the entire country. These ideas have been central to cooperative collection development among the Research Triangle university libraries from the beginning.[77]

Principles of Successful Cooperation

Librarians at the Research Triangle universities have identified several principles that have served their cooperative programs well. They include institutional self-interest, academic and collection strengths, audience and level of use, the centrality of subjects and materials to the local scholarly enterprise, and the way programs change over time.

Librarians have learned that cooperation must spring from institutional self-interest and that agreements must grow organically out of academic programs and collection strengths. Only by grounding cooperative responsibilities in this way can librarians create viable programs.[78] If they divide responsibilities too abstractly or arbitrarily and do not tie them to programs or collections, cooperation will not survive.[79] It follows, then, that because each participant must believe that cooperative programs serve its self-interest, cooperative programs must be viewed as mutually advantageous by all involved, although the benefits do not have to be absolutely equal. Librarians should therefore accept collecting responsibilities within regional or national cooperative programs only when they base them on the needs of their local institutions, because only then can their institutions be held truly accountable for fulfilling their obligations.[80]

Following this principle, librarians have discovered that they need to build agreements on what their library can and wants to contribute to cooperation. Colleagues at cooperating institutions cannot force each other to assume obligations nor restrict what they can acquire.[81]

Librarians have also learned to limit cooperative efforts to research materials. They specifically have excluded undergraduate and heavily used graduate titles, and considered the duplication of basic texts, sets, and serials desirable.[82]

Through decades of trial and error, librarians have come to realize that the subjects and materials covered by cooperative agreements must not be so central to research that faculty insist they be available locally, nor so marginal to it that tight funding jeopardizes a program's existence. If librarians accept cooperative responsibility for areas that are too peripheral to academic programs or library collections, the agreements will not survive the hard financial times that institutions periodically face. No matter how well intentioned, when funding cuts threaten major programs, cooperative agreements for materials at the periphery perish.

Finally, if the cooperative programs are to remain viable, librarians have recognized that they must be flexible.[83] As programs on campus change, new faculty research interests develop, or new collecting opportunities arise, cooperative agreements require modifications.

Types of Successful Cooperation

Over the years librarians have identified two major kinds of cooperation. The ad hoc approach is one of the most basic forms of cooperative collection development; it is also one of the most successful. Systematic cooperation is more complex and more limited in its applications.[84]

The earliest attempts at cooperation used the ad hoc approach. While it can be applied to all subjects and kinds of materials, ad hoc cooperation works best in exceptional cases, primarily for expensive titles. Appropriate candidates include large microform collections, costly periodical subscriptions, domestic and Western European newspapers, extensive serial backfiles, substantial multivolume sets, and items for special collections.[85] The high cost of materials in these categories justifies the time librarians must spend negotiating the decision to purchase them. The ad hoc approach to cooperation is not efficient for the regular, ongoing selection of books and serials, however.

Systematic cooperation for books, serials, and other library materials works

where institutions have unique academic programs or library collection strengths.[86] It is also viable in instances where more than one institution supports strong academic programs or library collections that are of interest to many disciplines but not central to any single one. Because these materials are important but not crucial to disciplinary subfields, it is politically possible for librarians to build cooperative programs for them. Materials that lend themselves to systematic cooperation include those that are distinct in format or method of acquisition, those that support foreign-area studies, and those that are interdisciplinary in nature. In all these cases, once librarians agree to cooperate, they do not need to consult with their cooperative collection development partners on each title.

One of the models for systematic cooperation consists of materials that are distinct in format or method of acquisitions. Government publications are excellent examples of this type of cooperative collection development. Librarians can divide responsibility by geography, subject, format, or issuing agency. Electronic resources may also provide opportunities for systematic cooperation.

Area studies materials also make excellent candidates for systematic cooperation, particularly titles published in foreign countries. Librarians can accept—or avoid—responsibility for these areas, based on academic programs or collection strengths. If they decide to share responsibility with another institution, a geographical division works well, because it is clearly defined and easy to remember. Indeed, with a few minor adjustments, the geographical division of responsibility for materials from and about Latin America, for example, has been successful for half a century.[87]

Systematic cooperation is more difficult for Western Europe and the United States, because materials from and about these parts of the world are more central to the scholarly enterprise in this country. One possibility is to develop an interdisciplinary approach to books, serials, and library materials that divides coverage according to academic and collection strengths, format, and geography, as we have done with Southern Americana and hope to do for environmental studies. As new areas of interdisciplinary research become more prominent, librarians will have more opportunities to explore this type of cooperation.

By contrast, agreements based on major academic subfields and specialties will not work, except on an ad hoc basis. Faculty need to have materials that are closely related to major subfields available locally. For conventional disciplines, then, there is still no successful model for systematic cooperation. In short, it seems to be impossible to divide academic disciplines in an academic way.

Factors Contributing to Successful Cooperation

Looking back over decades of cooperative effort, we have identified seven major factors that promote successful cooperative collection development. They include propitious circumstances, visionary and committed individuals, supportive organizational structures, appropriate staff participation, bibliographic and physical accessibility to collections, outside funding, and a history of successful cooperation.

First, circumstances have to be conducive to cooperation.[88] When the economic, social, political, cultural, or academic environment limits an institution's ability to provide resources, a joint effort becomes the best way to meet local needs. The situation at Duke and UNC–CH in the 1930s provided the impetus for cooperative collection development. Given the South's poverty, administrators, faculty, and librarians knew they did not have the resources to build major research libraries competitively, so they decided to meet the need for materials cooperatively. Over the decades, each major new cooperative initiative has begun for similar reasons—a need for library resources without adequate funds to acquire them locally. Now, al-

most sixty years later, the rising costs of library materials, the appearance of new electronic formats, and inadequate funding create new imperatives to expand cooperative collection development.

Second, key individuals must share both a vision of what cooperation can accomplish and a commitment to pursue cooperative options. While administrators, faculty, and librarians understood the limitations imposed by circumstances in the 1930s, they also had a vision of what they could accomplish through cooperation—not only for their own institutions but also for the region. Since then, library staff have continued to search for new ways to cooperate, while library administrators have supported them. Their vision and commitment have been crucial to success.[89]

Third, administrators must establish formal organizational structures that encourage cooperation.[90] Library cooperation in the Research Triangle began in the context of "cultural relations between the two institutions,"[91] and involved university administrators, faculty, and librarians. University administrators and faculty have continued to participate, but only up to a point. Librarians have never asked faculty or university administrators to ratify specific cooperative collection development agreements. Intrainstitutional structures that provided for greater faculty involvement and specific administrative endorsement would lend more credibility to cooperative agreements, because all parties concerned would have worked together to create them. These groups would therefore have a greater stake in maintaining them.

Interinstitutional structures are also important, because they foster an environment in which cooperation can take place. Cooperative collection development among the Research Triangle institutions began and has been periodically revitalized and expanded because university or library administrators created new organizations to promote it. The regular meetings of collection development staff, which began under the auspices of TRLN in the 1970s, provide opportunities for librarians to maintain old cooperative programs and create new ones. These meetings also encourage honest and open communication between librarians from different institutions, help selectors coordinate practices, and thereby socialize staff for cooperation.[92]

Fourth, the involvement of staff at the operational level is essential. No matter how much administrators promote cooperation, the key to success lies ultimately with individual selectors. They, and not administrators, create and operate the actual cooperative programs. Selectors therefore need to be intimately involved in all aspects of the cooperative process for their areas of responsibility.[93] The resulting participatory relationship among selectors ensures they will make realistic commitments and meet their obligations to each other.[94]

Selectors also need support and time.[95] A major reason the area studies programs have been successful is because full-time bibliographers have overseen their development from the beginning and have devoted considerable intelligence, creativity, and energy to maintaining them. Where cooperative programs for Western Europe and the United States exist, it is because full-time collection development officers have taken the initiative and worked with their part-time colleagues to bring such programs into existence. Cooperation in the sciences has not yet emerged. If it does, it will be partly because recently appointed full-time science bibliographers can nurture its development.[96]

Fifth, the experience of TRLN and other cooperative consortia demonstrates that librarians must provide information about the holdings of cooperating libraries and maximize the availability of their collections.[97] Bibliographic accessibility, faculty and student access to collections, and special document delivery have been critical to successful cooperation. In the 1930s, librarians duplicated main entry cards and created a union catalog. Shortly thereafter, they added direct faculty borrowing and daily document delivery.

During the 1980s, they created a joint online catalog, expanded borrowing for faculty and all students, and improved interlibrary loan (including the faxing of rush requests and free or subsidized photocopies of articles). New technologies offer even greater opportunities to link libraries in cooperative endeavors in the 1990s.[98] Indeed, although the proximity of the TRLN libraries aided cooperation in the past, advances in telecommunications and the appearance of electronic library resources reduce the significance of distance, both for the Research Triangle university libraries and for other institutions around the country.[99]

Sixth, librarians need to recognize the importance of outside funding both for initiating new ventures and revitalizing old ones. Although the TRLN cooperative programs began during the Depression when the economy could not have been worse, financial need alone did not lead to cooperation. As a matter of fact, a recent survey of cooperative collection development programs among members of the Association of Research Libraries found only one other program dating from the 1930s.[100] Rather, outside funding was the catalyst that brought cooperation into being and contributed to its success.[101] From their beginning in the 1930s, through the development of cooperative programs for area studies in the 1940s, 1950s, and 1960s, to the revitalization and expansion of cooperation in the 1970s, 1980s, and 1990s, every major cooperative initiative by TRLN librarians has come about because of the existence of outside funds used either as seed money or to lock in embryonic cooperative agreements.

Finally, a history of successful cooperation encourages its continuance and expansion.[102] In the case of TRLN, the cooperative programs are solidly established, well-known throughout the universities, and widely accepted by administrators, faculty, and librarians. After half a century members of the consortium have built formidable complementary collections. Any attempt to abrogate these arrangements would entail significant political and economic costs. Therefore, just as historical circumstances provided the impetus that led to cooperation in the 1930s, they are now influential in ensuring its survival.

Approximately two-thirds of a century ago, during the depths of the Depression, administrators, faculty, and librarians at Duke and UNC–CH realized that they would never have enough money to build two separate comprehensive collections. By working together, however, TRLN librarians have built coordinated, interdependent, and interlocked collections of far greater breadth and depth than they could have achieved alone.

Currently librarians across the country face similar problems. They cannot afford to acquire all the materials scholars need for research, nor will they be able to document fully contemporary civilization. By cooperating, however, librarians can build local, regional, and national collections that serve both their institutions and the world.

REFERENCES AND NOTES

1. Indeed, Joe Hewitt and John S. Shipman found that "the theoretical necessity and potential benefits of cooperative collection development are almost universally recognized," and even "libraries reporting no cooperative collection development activity seemed as favorably disposed to the *idea* of cooperative collection development as those in libraries actively engaged in programs." "Cooperative Collection Development among Research Libraries in the Age of Networking: Report of a Survey of ARL Libraries," *Advances in Library Automation and Networking* 1 (1987): 191, 198.
2. Database Overlap Study (Chapel Hill, N.C.: TRLN, Oct. 31, 1988), and TRLN Database Overlap Study (Chapel Hill, N.C.: TRLN, May 1992).
3. Quoted in Minutes of the Department Heads Meeting (Academic Affairs Library, UNC–CH), Oct. 24, 1989, 2.

4. U. S. House, Subcommittee on Postsecondary Education, *Hearing on the Reauthorization of the Higher Education Act of 1965: Library Programs* (Serial No. 102–35) (Washington, D.C.: Govt. Print. Off., 1991): 42.
5. Hewitt and Shipman found only one cooperative collection development program among ARL institutions older than that of the Research Triangle university libraries—and it is confined to the field of religion. 202.
6. Before the creation of the university system in 1963,"UNC" consisted only of the Chapel Hill campus; after that date the formal designation of "Chapel Hill" was added.
7. Robert Estall, *Population Change: The American South* (London: John Murray, 1989), 5.
8. Louis R. Wilson, *The Library of the First State University: A Review of Its Past and a Look at Its Future* (Chapel Hill, N.C.: University of North Carolina Library, 1960), 23, 27.
9. For statistics on collection size, growth, and expenditures during this period, see Robert E. Molyneux, *The Gerould Statistics, 1907/08–1961/62* (Washington, D.C.: Association of Research Libraries, 1986) and U.S. Advisory Committee on Education, *Library Service*, report prepared by Carleton B. Joeckel (Washington, D.C.: Govt. Print. Off., 1938): 91.
10. For concise discussions of regionalism and the New South ideology, see Charles Reagon Wilson and William Ferris, *Encyclopedia of Southern Culture* (Chapel Hill, N.C.: Univ. of North Carolina Pr., 1989): 1113–15, 1121–22.
11. (Durham-Chapel Hill, N.C., 1935), 7–8.
12. *Program of Cooperation*, 9.
13. General Education Board, *Annual Report* 1947/48, 45. See also its *Annual Report*, 1933/34, 23–25, and 1934/35, 33.
14. Raymond B. Fosdick, *Adventure in Giving: The Story of the General Education Board: A Foundation Established by John D. Rockefeller* (New York: Harper, 1962), 269–73.
15. E. Morrell, letter to Frank [Porter] Graham, Apr. 6, 1934, and R. B. House, letter to [Robert Diggs Wimberly] Conner, May 14, 1934, Chancellor's Records, R. B. House Series, Faculty Affairs, Special Committees: Intellectual Cooperation with Duke, 1929–1934, University Archives, UNC–CH: 1.
16. Proposed Principles of Procedure for Cooperative Buying Program on the Part of the Libraries of Duke University and the University of North Carolina, n.d., Academic Affairs Library, Librarian's Records, Duke University–University of North Carolina Library Cooperation, 1930–1933, University Archives, UNC–CH.
17. UNC, *Report of the Division of Library and Library School* 1935/36, 1.
18. General Education Board, *Annual Report* 1933/34, 33.
19. Memorandum to President Graham on Application to the General Education Board for Funds for Library Research Materials, May 2, 1935, 3, Chancellor's Records, R. B. House Series, Committee on Intellectual Cooperation with Duke University, University Archives, UNC–CH; and Request for Aid in Developing Reference and Research Facilities in the Libraries of the University of North Carolina and Duke University (and its appendices) [May 4, 1935], 15, Libraries Records, Cooperation with UNC Library, AEB Acquisitions, University Archives, Duke University.
20. Robert B. Downs and Harvie Branscomb, "A Venture in University Library Cooperation," *Library Journal* 60 (Nov. 15, 1935): 877–79; and Harvie Branscomb and Robert B. Downs, "A Plan for University Library Cooperation," *School and Society* 42 (July 13, 1935): 64–66.
21. These principles and the specific guidelines for interpreting them are embodied in the Proposed Principles; see also articles by Downs and Branscomb, cited in n.20.
22. "Desiderata," *Library Notes* (Duke University), no. 15 (Dec. 1945): 13.
23. Robert B. Downs, "American Library Cooperation in Review," *College & Research Libraries* 6 (1945): 415.
24. Ibid.
25. *Program of Cooperation*, 10.
26. Ibid., 10–11.
27. Request for Aid, 12.
28. Ibid.
29. Ibid., 13.
30. Request for Aid appendices.
31. Report to General Education Board on Expenditure of Grant to Duke University and the University of North Carolina Libraries for Research Materials, Nov. 16, 1937, 2,

Libraries Records, Cooperation with UNC Library, AEB Acquisitions, University Archives, Duke University.

32. [Robert Downs], letter to Harvie Branscomb, July 6, 1936; Duke Documents, 1936–1959, University Archives, Duke University.
33. Cooperation with the University of North Carolina Library in the Collection of Public Documents, Duke Documents, 1936–1959, University Archives, Duke University.
34. See UNC, *Report of the Division of Library and Library School* 1936/37, 10; Memorandum of Conference with Mr. Nuremberger of Duke University Documents Department, Sept. 21, 1939, Duke Documents, 1936–59, University Archives, Duke University; and C. E. Rush, Concise Outline: Agreements and Understandings between the libraries [sic] of Duke University and the University of North Carolina Relative to Library Cooperation [Dec. 1, 1941], 2, Academic Affairs Library, Librarians' Records, Duke–UNC Cooperation: Memoranda, University Archives, UNC–CH. See also G. F. Sherperd, Jr., Carolina-Duke Cooperative Plan for Acquisitions of Documents, Apr. 10, 1942, Academic Affairs Library, Librarians' Records, Duke University–UNC Library Cooperation: 1942, University Archives, UNC–CH, in which the geographical division for state documents becomes more prominent.
35. UNC, *Report of the Division of Library and Library School* 1936/37, 2; and Academic Affairs Library, Librarians' Records, Carolina-Duke Cooperation, [1941?], Committee on Intellectual Cooperation, 1934–52, University Archives, UNC–CH, 1; see also Howard E. Jensen, "The Race Relations Collection of the Duke University Libraries," *Library Notes* (Duke University), no. 23 (Jan. 1950), 9–10.
36. Request for Aid in the Further Development of Materials for Advanced Study in the Libraries of Duke University and the University of North Carolina, [Jan. 1938], 2–3, Chancellor's Records, R. B. House Series, Committee on Intellectual Cooperation with Duke University, University Archives, UNC–CH.
37. Request for Aid in the Further Development, 5–6.
38. Carolina—Duke Cooperation, [1939?], 1–2, Academic Affairs Library, Librarians' Records, Duke–UNC Cooperation, University Archives, UNC–CH.
39. Quoted in *Friends of the Library* (n. d.), 1; reprinted from *The Alumni Review* (UNC) (July 1940).
40. See Sturgis E. Leavitt, "University Cooperation," Paper delivered at the Bibliographical Conference, Washington, D.C., Feb. 21, 1942, in his Papers Presented at Various Meetings, 1935–1955, North Carolina Collection, UNC–CH.
41. "Cooperation in Advanced Instruction and Research," in *Development of Library Resources*, 42; and Cooperation in Latin American Purchases Duke–UNC–Tulane, [Oct.? 1939] and Cooperation in Library Purchases between Duke University, Tulane University, the University of North Carolina: Policy and Procedures [1940?], Academic Affairs Library, Librarians' Records, Latin American Cooperative Program, 1938–41, University Archives, UNC–CH.
42. "A Grant for Books on Latin America," *Library Notes* (Duke University) no.9 (Oct. 1940), 4; and Rush, 5.
43. Cooperation in Library Purchases, 1–2.
44. "Grant," 4.
45. Cooperation in Library Purchases, 1–2.
46. Ibid., 1.
47. UNC, *Report of the Division of Library and Library School* 1939/40, 2.
48. University of North Carolina and Duke University Program of Library Cooperation, [May 1, 1942], 2, Libraries: Records of Cooperation with UNC Library, University Archives, Duke University.
49. University of North Carolina and Duke University Program of Library Cooperation, [May 1, 1942], 2–3. See also E. Carl Pratt, "Library Cooperation at Duke and North Carolina Universities," *College & Research Libraries* 2 (1941): 142–45.
50. "A Grant from the Carnegie Corporation," *Library Notes* (Duke University), no.10 (May 1941): 5.
51. Memorandum on University of North Carolina and Duke University Program of Library Cooperation, Oct. 8, 1952, 1–2, Chancellors' Records: R. B. House Series, Committee on Intellectual Cooperation with Duke, University Archives, UNC–CH.

52. See B. E. Powell, "Library Cooperation between Duke University and the University of North Carolina," *Library Notes* (Duke University), no. 31 (Nov. 1955): 13–15.
53. Duke-Carolina Cooperation and Its Extension (DCCE), July 1, 1956, 2, Cooperative Programs Files, Collection Development Department, Academic Affairs Library, UNC–CH [source hereafter cited as CPF].
54. Cooperative Lending Program of the Libraries of Duke, North Carolina State College, the University of North Carolina and the Woman's College of the University of North Carolina, Aug. 26, 1955, 1, Libraries Records, Cooperation with UNC Library, University Archives, Duke University.
55. DCCE, 2–3.
56. Ibid., 3.
57. Ibid., 3 and 5. After Tulane dropped out of the cooperative program for Latin America, Duke assumed responsibility for materials from Central America; UNC, for those from the Caribbean islands.
58. See correspondence between Gertrude Merritt (Duke) and Harry Bergholz (UNC) in the fall of 1959, CPF.
59. Benjamin E. Powell, letter to Jerrold Orne, June 9, 1961, and Orne, letter to Powell, June 22, 1961, CPF.
60. See Hendrik Edelman, "The Death of the Farmington Plan," *Library Journal* 98 (Apr. 15, 1973): 1253.
61. Duke University, *The University Libraries: Report to the President* 1963/64, 9.
62. John S. Curtiss, letter to Benjamin E. Powell, Apr. 17, 1962; and University of North Carolina-Duke University Cooperative Program in Russian and East European History, n.d.; both from Slavic Bibliographer's Files, Collection Development Department, Academic Affairs Library, UNC–CH.
63. Duke University–University of North Carolina Working Agreement on Africana Library Materials, [June 1, 1965], CPF; see also, Duke University, *The University Libraries* 1964/65, 5–6.
64. Tentative Selection Guidelines for Asian Materials, Mar. 15, 1972, Duke–UNC Cooperation, Administrative Offices, Academic Affairs Library, UNC–CH. These agreements were originally formulated in the fall of 1970.
65. Duke University, *The University Libraries* 1960/61, 6; and 1961/62, 4; and 1971/72, 2–3.
66. Duke–UNC Committee on Cooperation, Report of Meeting, Apr. 30, 1976, 1–2, CPF; see also Joe Hewitt, "Triangle Universities Library Cooperation Committee," in his Selected Unpublished Papers and Presentations 1976–1980 ([Chapel Hill, N.C.], n. d.).
67. On the last aspect, see Gary D. Byrd et al., "The Evolution of a Cooperative Online Network," *Library Journal* 110, no.2 (Feb. 1, 1985): 71–77.
68. Minutes of UNC-CH/Duke Meeting, Jan. 27, 1977, 2, CPF.
69. Memorandum to Miss Florence Blakely, from John S. Shipman, Re Final Report, Title II C, Strengthening Research Libraries Resources Program, Oct. 28, 1981, 1, CPF.
70. "Notes from the Hanes Meeting of October 15, 1981," 1, CPF, and John Shipman, "Total Materials Funds Associated with Cooperative Purchases, FY 1979/80–FY 1991/92" (Chapel Hill, N. C.: UNC–CH, Academic Affairs Library, Collection Development Department, Jan. 8, 1992).
71. See John Rutledge's articles: "Collecting French Regional History Cooperatively," *Collection Management* 8, no. 2 (Summer 1986): 63–77; and "Collecting Contemporary European Literature for a Research Library," *Collection Management* 5, no.1/2 (Spring/Summer 1983): 1–13.
72. Program for Cooperative Collection of French Regional Materials, Mar. 2, 1984, 1, West European Bibliographer's Files, Collection Development Department, Academic Affairs Library, UNC–CH.
73. James Rolleston, letter to John Rutledge, May 17, 1984; and Proposal for the Cooperative Collecting of Contemporary German Belles Lettres between UNC–CH and Duke University, [July 23, 1984], West European Bibliographer's Files, Collection Development Department, Academic Affairs Library, UNC–CH.
74. Helene Baumann, letter to John Rutledge, Jan. 11, 1989, and Rutledge, letter to Baumann, Jan. 27, 1989, West European Bibliographer's Files, Collection Development Department, Academic Affairs Library, UNC–CH.

75. See the CLR grant proposal: Cooperative Information Resources Development: A Constituency Based Policy Analysis [Chapel Hill, N.C.], Oct. 10, 1990.
76. David Stam agrees, citing the experience of the Research Libraries Group (RLG). "Collaborative Collection Development: Progress, Problems and Potential," *IFLA Journal*, 12, no. 1 (1986): 18. Richard M. Dougherty also shares this view: "To a financially strapped administrator, cooperation may be seen as a way to generate real dollar savings or to justify future budget reductions. But dollars saved is the wrong measuring rod—library cooperation rarely generates identifiable dollar savings. Cooperative programs in resource sharing and/or shared collection development are better viewed as strategies to enlarge the universe of titles available to library users and/or to speed up the delivery of documents through interlibrary lending/borrowing systems. These two criteria, availability and delivery, are more appropriate measures of the success of cooperative programs." "A Conceptual Framework for Organizing Resource Sharing and Shared Collection Development Programs," *Journal of Academic Librarianship*, 14, no. 5, (Nov. 1988): 287. See also Sheila T. Dowd, "Library Cooperation: Methods, Models to Aid Information Access," *Journal of Library Administration*, 12, no. 3 (1990): 66.
77. Hewitt and Shipman found that the expansion of the range of materials available to users, followed by a reduction in duplication, were also major objectives of cooperative programs among research libraries. 207.
78. Paul H. Mosher and Marcia Pankake in particular stress that "programs must be responsive and minimally threatening to local priorities" and that "emphasis should be on nonthreatening models which protect and recognize substantial and long-term institutional program commitments and seek to build on these." "A Guide to Coordinated and Cooperative Collection Development," *Library Resources & Technical Services* 27 (1983): 425. Donald Simpson agrees. "Library Consortia and Access to Information: Costs and Cost Justification," *Journal of Library Administration*, 12, no. 3 (1990): 96. Librarians in New York successfully established their cooperative collection development efforts on the assumption that "what libraries were actually doing in collection development in their institutions' self-interest, they would be willing to continue to do in the region's interest . . . . No monitoring or enforcement had been built into the State's program. Enlightened self-interest was, therefore, both the only motivation for following the regional plan and a very appropriate one in a cooperative system." Joan Neumann, "Impact of New York's Collection Development Funds on Resource Sharing," *Bookmark* 45 (Fall 1986): 26–29. Self-interest, coupled with financial incentives, has also been crucial to cooperation even for institutions within a system. See George J. Soete and Karin Wittenborg, "Applying a Strategic Planning Process to Resource Sharing: The Changing Face of Collaborative Collection Development among the University of California Libraries," *Advances in Library Resource Sharing* 2 (1991): 56–57.
79. George Jefferson says that one of the early attempts at library cooperation in the British Isles failed because "allocation of purposely narrow subjects fields to encourage participation was done arbitrarily," and that "large libraries found . . . it was difficult to reconcile this obligation with their duties to local readers." A more successful attempt in Wales assigned subject groups "after participating libraries had submitted their choice of subject." Eventually, however, there were so many objections "to the arbitrary allocation of subject fields," that librarians eventually retreated to an ad hoc method of acquisition. Jefferson attributes the success of a later experiment in the Newcastle area to the fact that "cooperative projects [were] founded on the realism of local circumstances and characterized by pragmatism rather than neat theoretical abstractions." *Library Co-operation*, 2d ed. (London: André Deutsch, 1977), 35–36 and 123. Librarians in Australia are also basing their cooperative efforts on collection strengths as related to local university programs, an organic and therefore successful strategy. See Margaret A. Cameron, "Evaluation and Inter-institutional Cooperation in Collection Development," *Australian Academic & Research Libraries* 20 (Mar. 1989): 23–28.
80. When librarians base cooperative commitments on local needs, they obviate Maidel K. Cason's concerns about accountability in national efforts. "Accountability in Cooperative Collection Development: The Elusive Ingredient," in *Academic Libraries: Myths and*

Realities: Proceedings of the Third National Conference of the Association of College and Research Libraries, ed. Suzanne C. Dodson and Gary L. Menges (Chicago: Association of College and Research Libraries, 1984): 245–48.

81. David Stam points out that all cooperative efforts by the founding members of RLG "were entirely voluntary, thereby recognizing the continued autonomy of each institution." "Collaborative," 10. This approach has been essential to the success of other cooperative programs. See Karen Krueger, "A System Level Coordinated Cooperative Collection Development Model for Illinois," in *Coordinating Cooperative Collection Development: A National Perspective*, ed. Wilson Luquire (New York: Haworth Press, 1986), 53–54; Soete and Wittenborg, 56; and Mosher and Pankake, 425.
82. Such a user-oriented approach allows cooperative programs to work even when institutions vary greatly in the breadth and depth of collections, as in the case of ILLINET libraries. See Krueger, 50–51.
83. In fact, Mosher and Pankake state that cooperative agreements should be reviewed every three to five years and modified to reflect any changes in practice. 429. Martha Smith stresses the same point. "Cooperative Collection Development for Rare Books among Neighboring Academic Libraries," *College & Research Libraries* 46 (1985): 160–67.
84. Hewitt and Shipman found ad hoc agreements on expensive research materials and the selection and cancellation of serials to be the most common form of cooperation among research libraries, while systematic divisions of responsibility based on subject, language, country of origin, or format were rare, and when they existed, they were narrow in scope. 191 and also 211–15.
85. Other cooperative ventures have had similar experiences. See Soete and Wittenborg, 53, 55, and 57, and Elizabeth Roberts, "Cooperation, Collection Management, and Scientific Journals," *College & Research Libraries*, 48 (1987): 247–51.
86. Elizabeth P. Roberts gives an example of such a program between the libraries of Washington State University and the University of Idaho, where UI has responsibility for journals in forestry and mining; WSU, for veterinary medicine, because the other institution does not have academic programs in those areas. "Cooperation," 247–51, and "Cooperative Collection Development of Science Serials," *Serials Librarian* 14, no. 1/2 (1988): 19–31. More broadly, David Stam, among others, states that the North American Collections Inventory Project's Conspectus was designed "to present a composite picture of collection strengths and current collection practices in participating libraries." Librarians are using information about these unique collection strengths to build systematic cooperative programs on a national scale. "Collaborative," 11.
87. This was the approach that the Farmington Plan and its national-level successors later adopted. More recently, local and regional cooperative programs, such as the Northwest Regional Consortium for Southeast Asian Studies, have assigned specialized collecting responsibilities for specific foreign countries to their member libraries. On the latter, see Marian Ritter, "Four Paradigms for Sharing Library Resources," *College & Research Libraries News* 52 (1991): 367.
88. David C. Weber noted that timing is often critical to successful cooperation and that economic motives are found in every example he cites. "A Century of Cooperative Programs among Academic Libraries," *College & Research Libraries* 37 (1976): 215, 219. More specifically, Stam states that "RLG was founded in a time of relative financial austerity in US libraries." "Collaborative," 18.
89. Smith also found that administrative support of cooperation is essential, because it helped to ensure the continuance of the policy. "Cooperative," 160–67. Conversely, one of the major reasons for the failure of cooperation in Louisiana was the lack of support from library administrators and governing bodies. Beverly E. Laughlin, "Barriers to Regional Collection Development," *Louisiana Library Association Bulletin* 52 (Fall 1989): 45–50. George Jefferson, analyzing the Newcastle approach to cooperative activity, states that "co-operation in the last analysis depends for success upon personalities who induce the wish to co-operate." He also points out "that the authority for projected co-operation should come from a broader base than just the actual libraries concerned and involve the highest executive level of the institutions." *Library Co-operation*, 122.
90. The administrative link of the libraries of the University of California system via the Office of the President, coupled with an official policy of "One University, One

Library," was the key factor in bringing about cooperation in that state. Soete and Wittenborg, 52. Based on a review of papers presented at a conference on cooperative collection development, Carl W. Deal concluded that "a governing authority should be established to coordinate efforts and respond to and set priorities." "A Model Criterion for Statewide Plan/Process/System," in *Coordinating Cooperative Collection Development: A National Perspective*, ed. Wilson Luquire (New York: Haworth Press, 1986), 217. Conversely, Hewitt and Shipman found that the lack of an appropriate organizational mechanism was one of the major reasons that research libraries failed to cooperate. 198.

91. *Program of Cooperation*, 5.
92. On the importance of these processes to successful cooperative programs, see Kurt Pond and Dwight F. Burlingame, "Library Cooperation: A Serials Model Based on Philosophical Principles," *College & Research Libraries* 45 (1984): 299–301. Conversely, communication breakdowns have contributed to the failure of many cooperative endeavors. Weber, 211.
93. The involvement of those actually selecting materials was also crucial in expanding cooperation within the University of California/Stanford consortium from a one-time, ad hoc Shared Purchase Program to the Shared Collections and Access Program, which also includes on-going and systematic ventures. Soete and Wittenborg, 56–58. Moreover, Mosher has observed that "collaboration is achieved by working ahead, planning, reflecting, and talking with both users and colleagues about the collections, the programs they serve, and about aspirations for the collections of the future. The accomplishment of working collaboration among people doing selection and making collection management decisions is more central to effectiveness than distribution of subject, language, discipline or format." "Collaborative Collection Development in an Era of Financial Limitations," *Australian Academic & Research Libraries* 20 (Mar. 1989): 12–13. See also his "Cooperative Collection Development Equals Collaborative Interdependence," *Collection Building* 9, no. 3/4 (1988): 29–32.
94. Mosher cites psychological studies showing that "effective cooperation is most readily achieved by forming small working teams" and that "such groups tend to foster cooperation rather than competition, and collaboration has been shown to strengthen such groups and encourage them to complete more challenging tasks." "Cooperative Collection Development Equals Collaborative Independence," in *Collection Management: Current Issues*, ed. Sarah Shoemaker (New York: Neal-Schuman Publishers, 1989), 31. See also his "Collaborative Interdependence: The Human Dimensions of the Conspectus," *IFLA Journal* 16 (1990): 329. This atmosphere of honesty and trust helps promote accountability on the personal level and thereby addresses Cason's concern about the lack of accountability in cooperative collection development. "Accountability," 245–48.
95. On the importance of allocating staff and time for cooperative activities and providing means of continuous interaction through formal and informal meetings, see Mosher and Pankake, 425, and Deal, 217. Conversely, one of the major problems of cooperative programs is the lack of communication between partners. Hewitt and Shipman, 221.
96. Administrators at other libraries have recognized the importance of full-time staff to run cooperative programs. In 1986 the Illinois State Library established the position of Coordinator of Cooperative Collection Development to supervise cooperation in Illinois. "The establishment of this office has directly influenced the course of cooperative collection development in Illinois." Terry L. Weech, "Networking and Cooperative Collection Management—The Illinois Experience," *Collection Building* 10, no. 3/4 (1989): 55.
97. Bibliographic and physical accessibility have been central to the success of every cooperative program. See, for example, Deal, 219–20. According to Hewitt and Shipman, 95 percent of the ARL institutions provided special physical access or interlibrary loan privileges to users of partner libraries as part of the cooperative collection development agreements. 219–20. In fact, Mosher and Pankake state that cooperation "presumes easy bibliographic access and delivery in a time frame rapid enough not to have detrimental effect on the work of institutional users." 428.

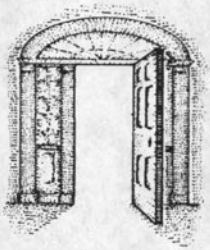
98. Hewitt and Shipman consider advances in national bibliographic networks in the late 1970s to be one of major factors behind the surge in cooperative programs that occurred during that time. 190 and 203. On the other hand, based on visits to nearly four dozen charter members of OCLC, Hewitt concluded that "coordinated collection development does not arise automatically simply because of the existence of a successful network," but that "strong independent initiatives are necessary." "Impact of Networks on Collection Development," *Library Acquisitions* 1 (1977): 213.
99. As an indication of how significant they might be, RLG's Conoco Study revealed that selectors in the humanities were willing to change 40 percent of their selection decisions "and rely on collections at other institutions if they could be reasonably sure of both bibliographic access and physical availability of items in those collections (maximum of seven days for delivery of materials)," while science selectors were willing to change up to 50 percent of their decisions if items could be obtained within three days. Mosher, "Cooperative Collection Development," 31.
100. Hewitt and Shipman, 202.
101. In his survey Kraus considers outside financial assistance to be essential. 179. Deal also emphasizes the importance of seed money in initiating cooperative collection development, but considers that "long-term maintenance of programs of cooperative collection development depends upon incorporating their support into ongoing budget allocations." 218–19.
102. See, for example, Bernard G. Sloan, "Resource Sharing among Academic Libraries: The LCS Experience," *Journal of Academic Librarianship* 12 (1986): 28.

A Better Way To Search Databases

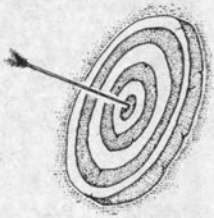
We started in 1985, database searchers committed to better search software design. We became the premier vendor of Medline, then expanded our catalog to other databases. Last year we won Information World Review's PRODUCT OF THE YEAR for faster, easier search software. But a better way means meeting the evolving needs – individual and campus wide – of today's library users.

Announcing OVID: a database interface so flexible it molds itself to your search environment.

With OVID you're free to move from one operating system to another without retraining. OVID's Common User Interface assures identical functionality in DOS, Windows and UNIX.

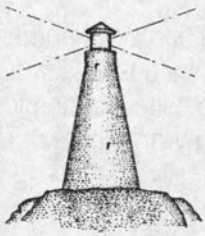


A haven for beginners, OVID's Easy Mode has on screen prompts. The more experienced can pull-down menus showing an array of search options. Experts will feel at home using online syntax.



Search with natural language if you like. OVID mapping cuts through the mystery of controlled vocabularies, homing in on precisely matching subject headings.

There's an unprecedented array of search tools – indexes, thesauri, limits and fields – many never before available in an interface. They're all standard OVID features.



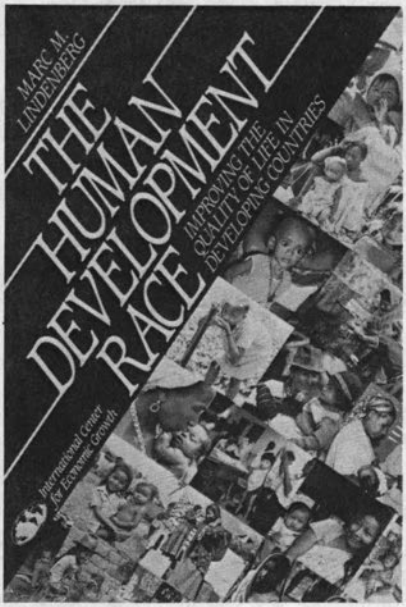
HELP for every search function is context-sensitive and on screen, never more than a key-stroke or mouse click away.

OVID. A better way to search ERIC, Current Contents, PsycINFO®, Medline, Readers' Guide Abstracts, EMBASE and more.

CD PLUS Technologies

New York 800-950-2035/212-563-3006 London 44-(0)81-748-3777 Amsterdam 020-672-0242

ANNOUNCING



The Human Development Race explains why some developing countries have readily succeeded at improving the health, education, and income of their citizens while others seem mired in failure. After examining economic and social factors in the performance of ninety countries, Lindenberg focuses on the experiences of six Central American countries, furnishing wide-ranging, and sometimes surprising, conclusions.

Marc M. Lindenberg is currently senior vice president of programs for CARE, on leave of absence from his position as a public policy lecturer at Harvard's John F. Kennedy School of Government.

1993, 233 pages, Cloth ISBN 1-55815-277-6, $29.95
Paper ISBN 155815-278-4, $14.95

PUBLISHED BY ICS PRESS

"*The Human Development Race* combines human resource issues and quality of life issues in a creative fusion that allows a richer analysis than the usual economic approach. Lindenberg successfully tackles the thorny problems of measuring improvements in a practical and theoretically compelling way."

— William Ascher
Professor, Sanford Institute of Public Policy
Duke University

Order with MC or VISA: (800) 326-0263 in the United States
(415) 981-5353 outside the United States Fax: (415) 986-4878

INTERNATIONAL CENTER FOR ECONOMIC GROWTH
720 MARKET STREET, BOX L1 SAN FRANCISCO, CALIFORNIA 94102

Exploring the Intellectual Organization of an Interdisciplinary Research Institute

Bryce L. Allen and Brett Sutton

Planning and implementing library services for interdisciplinary research communities pose special challenges for academic librarians. Data were collected on journal reading patterns in an interdisciplinary research institute (the Beckman Institute at the University of Illinois at Urbana-Champaign). Analysis of these data produced a number of maps of the intellectual structure of this user community. This understanding of the structure of the academic community and how it changes over time provides a basis for developing library services that will meet the special needs of this community.

Academic libraries are sometimes in the position of providing information services to parts of the academic community that are not organized along traditional departmental lines. Specialized research institutes focusing on particular scientific problems are one example. Many campuses now have centers for the study of specialized topics ranging from cognitive science to the breeding of Chinese pigs. Interdisciplinary groups concerned with topics such as Latin American Studies or Women's Studies constitute another example of specialized institutes.

Providing services to such groups can present challenges for academic libraries that are organized according to traditional areas of subject specialization. Subject specialization, institutionalized in departmental libraries (such as a physics library or a mathematics library) or in the work of subject bibliographers, seems to be based on an assumption of a homogeneous user population. Librarians establish a specialized library or specialized services because we think there is a population of users who have similar information needs. Physics libraries are created, or physics bibliographers hired, to serve physicists and physics students. If these users did not have similar needs, the departmental library or subject specialist bibliographer would not be the best approach to service. Sometimes academic libraries are affected by institutional inertia and remain organized along traditional disciplinary boundaries even when these boundaries no longer reflect the academic communities the libraries serve. The debate con-

---

Bryce L. Allen and Brett Sutton are Assistant Professors in the Graduate School of Library and Information Science, University of Illinois at Urbana-Champaign, Urbana, Illinois 61801. *Research for this article was done under the aegis of the Project on Scholar Communication and Information Transfer, Leigh Estabrook, Project Coordinator, and was funded in part by grants to the project from the Research Board of the University of Illinois. The authors wish to thank the federated researchers in the project, Theodore Brown, Director of the Beckman Institute, and the librarians and staff at the Beckman Institute Library for their helpful suggestions and comments.*

cerning the role of academic branch libraries is summarized admirably by Leon Shkolnik.[1]

Librarians, even those in specialized libraries, recognize the necessity of providing flexible service to a heterogeneous user community and know from experience that the needs of users, even within a particular discipline, are not homogeneous. At some universities, when local resources are available and interest is high, special collections are established to meet the needs of emerging user groups. For example, computer science collections emerge from mathematics and science libraries, or area studies libraries are created to meet the needs of special programs. If special collections cannot be created, some departments may establish their own informal reading rooms, although these services may be less than ideal. More often, librarians find ways to meet the needs of a heterogeneous user community by developing channels of communication within existing library structures. Subject bibliographers who develop good working relationships with faculty and students can respond to many different user needs. Collaboration among subject specialists can help to assure an appropriate balance of materials in library collections. But these labor-intensive solutions cannot always keep pace with changes in the academic community. Sometimes library users working in interdisciplinary areas may have to adapt to the traditional organization of collections and services by visiting each of the appropriate service areas in turn.

In the case of specialized research institutes or interdisciplinary working groups such as area studies departments, to assume that there is a homogeneous user population is particularly erroneous. A research institute on cognitive science, for example, may involve linguists, psychologists, and computer scientists. A Latin American Studies department may have political scientists, sociologists, and literary scholars. In situations where the population of users is not homogeneous, librarians charged with providing information service should seek systematic information about the intellectual organization of the user community. If librarians can learn more about an intellectual organization, they are in a better position to ensure that users and librarians can cooperate to provide the information people need. The library staff is able to meet the users halfway, adapting to the organization of the user community even as users adapt to the organization of the library.

Librarians establish a specialized library or specialized services because we think there is a population of users who have similar information needs.

Recent studies, including the work of Julie Hurd and Paul Metz, have demonstrated that interdisciplinary work is now widespread in academic communities.[2,3] Although our work focused on an interdisciplinary research institute, we believe that the methods outlined below may have broad application as academic librarians consider the ways in which they will organize services to meet the needs of their user communities.

STRUCTURE OF USER COMMUNITIES AND SERVICE PATTERNS

The problem addressed in this research, generally stated, is: How can library service be structured for user communities that do not fit the typical department-centered or discipline-based structure? Our approach to resolving this problem was to develop ways of examining the intellectual organization of the user community. In other words, it is not enough to acknowledge that interdisciplinary research institutes seem to be structured differently from other user groups on campus. They can, theoretically, have a variety of internal organizing structures, each of which might suggest a different approach to providing library service. The challenge is to figure out how these institutes are structured.

It is possible that an interdisciplinary research institute might promote interdisciplinary work and examine topics that can be viewed from a variety of perspectives and yet reflect, in microcosm, the usual academic organization of a university. For example, a Latin American studies unit might consist of groups of economists, political scientists, and historians who interact within their disciplinary groups but do not cross disciplinary boundaries in their research. If this were true, then the user community would be organized into a number of stable independent components, each component having its own particular information needs. In such a circumstance the library could organize its service by providing reference tools, selective dissemination of information (SDI), or collections that are tailored to the specific information needs of each component of its user community. This would be accomplished by developing a number of small "departmental" service units to meet the information needs of each of the components of the user community. But it is also possible for the user community to have a more dynamic intellectual organization in which library users do not limit themselves to materials from their own discipline. Users may cross disciplinary boundaries, working with one set of colleagues at one time, and another set of colleagues at another time. Their information needs may vary significantly from day to day. In such a dynamic situation, discretely structured information services would be counter-productive. More flexible, integrated approaches to reference, SDI, and collection building would be needed. Ideally, the organization of library services for such a user community would need to echo the complex structure of the user community. A centralized, integrated information service offering a variety of reference tools, information retrieval, and SDI would probably provide the most appropriate service to such a dynamic community. Members of the user community could select from these varied services the tools that might best meet their information needs at a particular time.

Other ways in which user communities could organize themselves require other service strategies. In some user communities, there may be hierarchical organizations of users in which information needs depend at least in part on a user's level in the hierarchy. In this type of community, services could be designed to meet the needs of each of the hierarchical levels, with new services being offered to people as they change their levels in the hierarchy. Librarians who serve businesses or work in management information systems often encounter hierarchically organized situations. An interdisciplinary research unit could be organized hierarchically, but this is certainly not traditional for academic organizations. Similarly, there may be user communities in which there is a majority group of users and one or more minority user groups. In such cases, information needs may depend on whether the user is part of the majority group or takes a minority approach to scholarship. For such a community, it might be appropriate to design information services for each of the "approaches" to the research topic. Finally, it is not uncommon for user communities to be organized around research projects. In this type of research institute, library services could be designed for each project, as suggested by Harry Llull.[4]

These examples illustrate the importance of understanding the intellectual structure of a user community so that librarians may offer appropriate information services to that community. Academic librarians usually have the opportunity to gain an understanding of the intellectual organization of their user communities. They see and talk to users from all parts of that community on a regular basis, participate in meetings and colloquia, and take part in the governance of their academic community. But busy librarians may not be able to participate extensively in academic affairs, and their unfamiliarity with a user community and its intellectual organization may prevent optimal planning and evaluation of information services. Our objective in this research was to explore a

more formal means of identifying the ways in which user communities are organized, and so to provide a set of tools that might be of assistance to librarians who are faced with the task of providing information services to an interdisciplinary research institute.

INDICATORS OF USER COMMUNITY STRUCTURE

In approaching this task, we considered many of the characteristics of a user community that might serve as indicators of the intellectual organization of that community. For example, informal communication patterns are one such indicator, as are patterns of research collaboration. It is quite possible to assess who communicates with whom, and who works with whom, and to map the structure of the user community from these indicators. However, both of these indicators are relatively narrow in applicability. Identification of informal communication patterns through social network analysis is helpful, but possible only in relatively small user communities. In a large research institute or interdisciplinary studies group, particularly one in which the composition of the user community changes rapidly over time, such methods are costly and difficult to manage. Research collaboration (usually identified through coauthorship of papers) focuses on only one kind of interaction. We thought that using this indicator would provide an incomplete understanding of the nature of the user community we were studying.

From the possible indicators that we considered, we selected journal use (viewed from several perspectives) as the indicator that seemed most appropriate to our task of identifying the intellectual organization of the particular user community we studied. We assumed that if people used the same journals, they were likely to share academic interests, speak the same technical language, and to share some interest with the authors who published in the journals. In other words, people who use the same journals are closer together in the intellectual organization of a community than people who seldom or never use the same journals. This assumption is shared by Hurd and by many of the studies of interdisciplinarity she cites in the thorough literature review contained in her article.[5]

THE RESEARCH SITE

The library user group we studied came into existence as the result of the establishment of the Beckman Institute at the University of Illinois in 1989. Designed as an interdisciplinary research institute to investigate aspects of human and machine intelligence, the Beckman Institute brought together scholars from a variety of disciplines ranging from physics to psychology and from philosophy to computer science. Faculty and students were organized into research groups, each with designated office and laboratory space and support staff. Because these groups did not map directly onto existing academic departments, and were instead organized around general research areas, they were useful in providing a first approximation of intellectual organization.

There were, however, reasons to question the adequacy of this organizational structure as an indication of the intellectual structure of the Beckman Institute. Some of these research groups existed before the creation of the institute as natural communities of scholars sharing research interests, but others appeared to have no specific research agenda and served rather as umbrella organizations under which individual faculty pursued particular research agendas. In other cases, topics of scholarly investigation and study appeared to be shared by several groups. By focusing on journal use, an indicator of intellectual activity, we were able to identify the high-level intellectual organization of this user community, as opposed to its institutional structure. We attempted to show how the groups initially established in the institute combined into broader groups or clusters that shared research interests and perspectives.

The scholars and administrators who planned the Beckman Institute saw the

overall collection of the University of Illinois Libraries as supportive of the research and instruction of the institute. A special academic library was included within the institute, designed primarily as a service point rather than as a collection. The Beckman Institute Library established a small collection of highly used journals, but the greatest emphasis in this library was on the provision of electronic access to information through locally generated and mounted databases, CD-ROM bibliographic services, and online searching. Another important service was a heavily used article copy service, in which photocopies of articles from journals were requested by Beckman Institute faculty and students, and provided free of charge by the library from the University Library's collections, or through interlibrary loan.

Our objective in this research was to explore a more formal means of identifying the ways in which user communities are organized, and so to provide a set of tools that might be of assistance to librarians who are faced with the task of providing information services to an interdisciplinary research institute.

The objectives of this research were to explore means of data collection and analysis that reveal the intellectual structure of a user community. We were interested in investigating a variety of ways to obtain insights about the high-level organization of scholars (faculty and students) within an interdisciplinary research institute. As a secondary objective, we wanted to identify methods of analysis that could be used by professional librarians. We used a variety of microcomputer hardware and software that would be available to many professionals in academic libraries. In other words, we wanted not only to explore the intellectual organization of one research community, but to do so in a way that would benefit professionals working with similar research communities.

DATA COLLECTION

Data on the journal reading patterns of members of the user community of the Beckman Institute Library were gathered in three ways. As part of a larger project examining scholarly communication and information transfer within the institute, all full-time faculty members appointed to the institute were interviewed using a structured interview schedule. One set of questions asked faculty members to identify the journals they read regularly in connection with their research. Responses to these questions were aggregated by research group for analysis, so that the results could be presented anonymously. The frequency with which journal titles were mentioned by all of the faculty within a research group was tabulated into a separate journal list for each research group. Although this mechanism suppressed differences between scholars within groups, it provided a data set that was ideal for establishing the higher-level intellectual organization of the institute.

The second data collection was accomplished with the cooperation of the Beckman Institute Library. Records of the article copy service were summarized in such a way that individual users' reading could not be identified. These data were aggregated into a similar set of journal lists for each research group for each of the first four academic terms in which the service was offered. Each list also contained the frequency with which articles from a particular journal were requested by users associated with a particular research group. These lists were further aggregated into a single list of the first fourteen months of the service for each department. The data from the article copy service were less complete than the interview data in certain ways. Some of the members of the user community who were interviewed made no use of the library's service, and so were not included in the article copy service data. Similarly, we assumed that scholars do not request from the library photocopies of articles from journals to which they subscribe. As a result, these data did not include

some of the central reading habits of members of the user community. However, the data from the library article photocopy service were also more complete than the interview data in some ways. Articles requested by all members of the user community were recorded, so reading patterns of the students of the institute as well as of its faculty were included. Also, articles were requested from many journals that would not have been considered as "read regularly." As a result, a broader picture of reading patterns was obtained from the library data.

If librarians can learn more about an intellectual organization, they are in a better position to ensure that users and librarians can cooperate to provide the information people need.

The third method of data collection involved scanning three current years of citation indexes (both *Science Citation Index* and *Social Science Citation Index*) for articles written by faculty from the Beckman Institute. The citation records from each citation index entry were copied into a database that allowed us to compile a list of all of the journals cited by scholars from each research group. In this case, citations from published articles were taken as evidence of the reading patterns of the members of the user community. There are a number of advantages in this type of data. Because the data are publicly available, this approach to data collection is unobtrusive. Because authors usually cite articles directly relevant to their scholarly work, citations provide a reliable measure of the information that the scholars think is important. There are also some disadvantages associated with using citation data to explore the intellectual structure of a user community. Citations may reflect previous reading, rather than current research interests, and so may be less relevant to the current intellectual structure of the community than the other measures used in this research. In the case of articles coauthored by scholars from outside the user community, we do not know whether the citations reflect the reading of members of the user community or that of the coauthors. In addition, this method of data collection is constrained by the selection of source articles by Institute for Scientific Information, the producer of the citation indexes. It is possible that citations from articles not covered by the citation indexes would have added to our understanding of the intellectual structure of the community. Finally, these data require considerable database expertise to convert the citation index entries into lists of journals consulted by groups of scholars.

Identifying the same variable (in this case, journal use patterns) through different types of data provides many advantages. In this study, there were rea-

TABLE 1
COMPARISON OF THREE SOURCES OF JOURNAL USE DATA

Source of Data	Advantages	Disadvantages
Survey	Direct	Possibly incomplete
	Provides contextual information	Subject to selective recall
	Stresses most used titles	Obtrusive
		Provides title, not frequency of use
Copy Service	Reflects current interests	Does not include some scholars
	Unobtrusive	May not reflect all journal reading
	Provides frequency of use	
Citations	Broader base	May reflect previous reading
	Unobtrusive	May overemphasize peripheral subjects
	Multidisciplinary	Limited by ISI coverage
	Provides frequency of use	May reflect reading of co-author

sonably high correlations (r = .52 to .62) between the similarity matrices produced from the three types of data, so we were confident that these different approaches were reliable measures of journal use. It would have been possible to combine the results into a single index of journal use, but we thought that separate analyses of the data would reflect their richness, and would allow the advantages of individual measures of journal use to compensate for the disadvantages of other measures. Table 1 outlines our perception of the advantages and disadvantages of each of the three approaches to data collection that were used in this research.

DATA ANALYSIS

The lists of journals consulted by members of research groups were analyzed to produce a cosine similarity measure for each pair of groups. The cosine measure is a value between 0 and 1 reflecting the similarity between pairs of groups, based on the frequency with which the same journals were mentioned or requested by members of those groups. The result was a matrix of similarities that showed how similar each group was to every other group. The similarity matrices formed input to two additional kinds of analysis. The first was multidimensional scaling, which produces a two-dimensional configuration. It creates a map of the intellectual community, with groups shown to be similar to each other appearing closer together on the map and with dissimilar groups farther apart. The second analysis was hierarchical cluster analysis. This analysis placed research groups with similar journal use patterns into higher-level clusters. These clusters were then located on the two-dimensional maps produced by multidimensional scaling. Frequently this type of analysis has been helpful in understanding the intellectual structure of disciplines; technical details are provided in articles by Katherine N. McCain and by Henry Small and E. Sweeney.[6,7,8]

Lists of journals consulted by groups of scholars can also be used to generate similarity measurements between journals. If two journals are consistently read by the same people, it is assumed that their content is similar. In the case of the interview data, similarities between journals were identified using cosine measures. This allowed a map of journal titles, analogous to the maps of the intellectual community, to be created. In addition, simultaneous clustering of journals and groups showed which parts of the user community were most closely associated with the use of particular clusters of journal titles.

FINDINGS

Comparison of Data from Three Sources

Interview Data. The faculty appointed to the Beckman Institute were interviewed to assess a variety of issues related to information gathering and scholarly communication. As part of these interviews, scholars were asked to identify the journals they regularly consulted in connection with their research. Figure 1 presents the clusters of groups identified on the basis of the responses of the researchers during these interviews.

This map presents the result of the analysis of the interview data described above. Before moving to a discussion of the differences between this map and those produced from other data, it may be helpful to outline the main features of all the maps. Each letter represents a research group. For example, in the Psychology cluster, the letters represent groups with names like "Cognitive Neuroscience" and "Visual Processing." The groups whose reading patterns were similar are closer together on the map. Normal maps have an orientation (for example, north at the top) that helps users read them. Regarding the type of map created in this project, the orientation of the map is a matter for interpretation. It seemed clear to us that the top of the map contained groups who adopted approaches that might be called "scientific" while those toward the bottom seem to have adopted engineering approaches. Toward the top, for instance, are groups investigating neuronal patterns and other aspects of cognitive science, while toward the bottom are

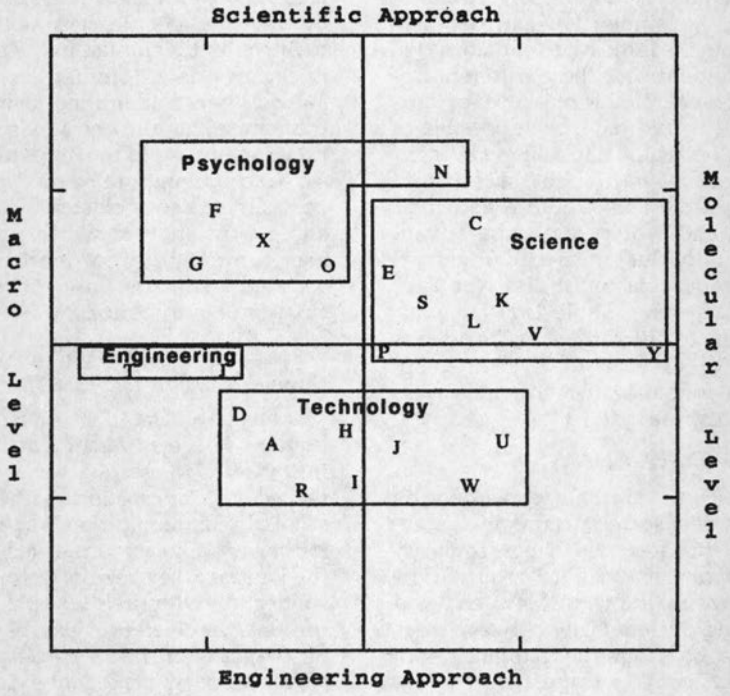


FIGURE 1
Clusters from Interview Data

groups investigating organometallic materials or decision processes in computerized networks. The other "direction" on the map was more difficult to interpret. At first, we thought that social science was on the left and pure science on the right. Since a number of engineering groups were found on the left, this interpretation was inappropriate. Our final interpretation of the horizontal dimension on this map was that groups toward the right of the map are concerned with phenomena at the molecular level (or even atomic level) while those to the left of the map are concerned with what we have called the "macro" level. Toward the right of the map are groups doing scanning tunneling microscopy and working on materials chemistry, while to the left are groups investigating much larger phenomena, such as the architecture of intelligent systems (including the brain).

The cluster boundaries superimposed on the letters represent the results of cluster analysis, in which similar groups were placed into high-level clusters. The labels assigned to these clusters are based on our interpretation of the common interests in the research groups represented in each cluster. For example, the Science cluster contains groups like "Molecular Biophysics" and "Prokaryote Genome Analysis." A comparison of the different views of the user community presented in this article will show that there appear to be six of these high-level clusters in the Beckman Institute (Applied Science, Artificial Intelligence, Engineering, Psychology, Science and Technology), but that the boundaries between some of the clusters are not well defined in some of the data.

Library Article Photocopy Service Data. Over fourteen months, careful records were made of all journal titles

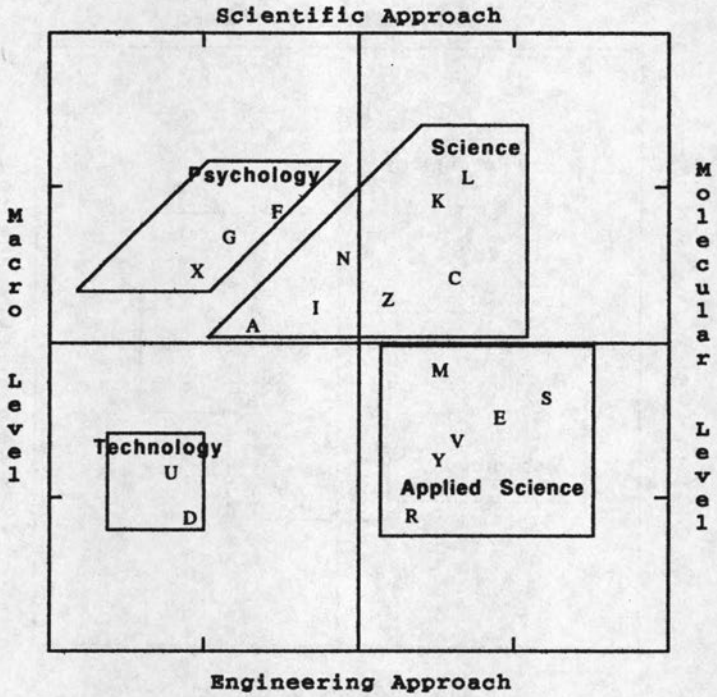


FIGURE 2
Clusters from Article Copy Service Data

requested by faculty and students of the Beckman Institute from the Beckman Library. From these lists, a map of intellectual structure of the user community based on actual reading patterns rather than reported reading patterns was derived. Figure 2 shows the clusters of groups identified on the basis of fourteen months of data from the article photocopy service.

The similarities between this map of the intellectual structure of the community and the one produced from interview data are clear. For example, the Psychology and Science clusters are roughly the same. There are also a number of important differences between the two data sets that are illustrated by these two figures. The first difference is that the Engineering cluster identified through interviews is absent from the library data. It would appear that researchers in this cluster made little or no use of the library's article copy service. In other words, the interview data identified a group of potential library users in the intellectual community who were not making use of one of the important services of the library.

On the other hand, the library data showed a clear difference between the Applied Science and Technology clusters that had been grouped together as a Technology cluster based on the interview data. This seems to indicate that there are a few main journals shared by these clusters and all of the scholars mentioned these journals in the interviews. However, when detailed evidence of reading was examined, it showed that there was sufficient difference in reading patterns to create two separate groups. Because of the additional detail provided by the library data, a clearer picture of the con-

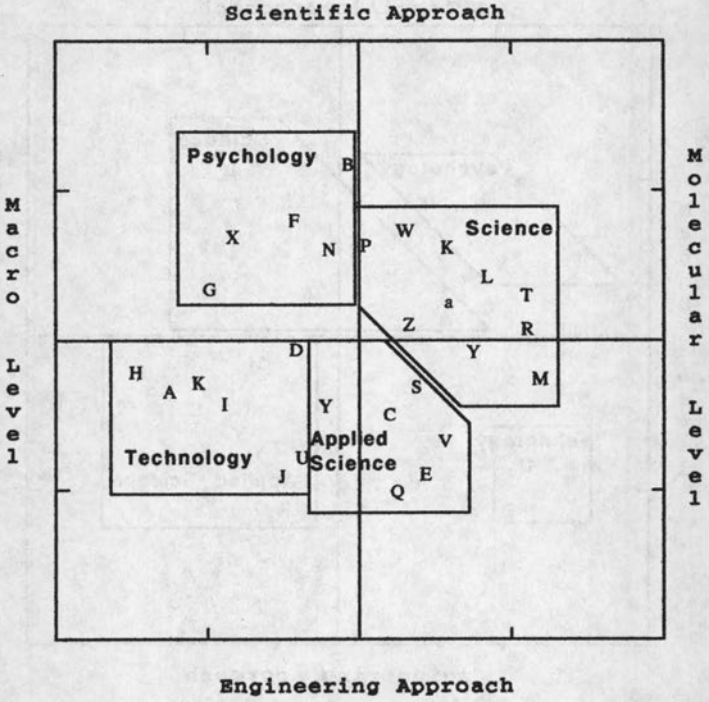


FIGURE 3
Clusters from Citation Data

figuration of the intellectual community emerged.

Although it is difficult to see differences in detail by examining the maps, the analysis of these two types of data showed that some of the research groups were included in one cluster based on the interview data, and in a different cluster based on the library data. For example, group N appears in the Psychology cluster in the maps based on interview and citation data, in the Science cluster in the map based on the library data, and even in the Applied Science Cluster in one of the longitudinal maps discussed below. These groups are of great potential interest, because they seem to be located at the boundary between clusters. Such boundary-spanning groups can perform an essential role in the development of an intellectual community. From the perspective of library service, they are likely to require a broader range of information than groups consistently found in the same cluster. In other words, boundary-spanning groups defy traditional approaches to library service, and require innovative approaches by library professionals to meet their wide-ranging information needs.

Citation Data. Figure 3 is a map of the intellectual community of the Beckman Institute based on citation data.

Clearly, this map resulted from a very different kind of data, and it is not surprising that there are a number of differences between this map and those presented above in the relative location of the clusters. In addition, more groups appear on this map than on the map generated from library data, because all publishing faculty were included, whether or not they made use of the library photocopy service. Thus there is more detail

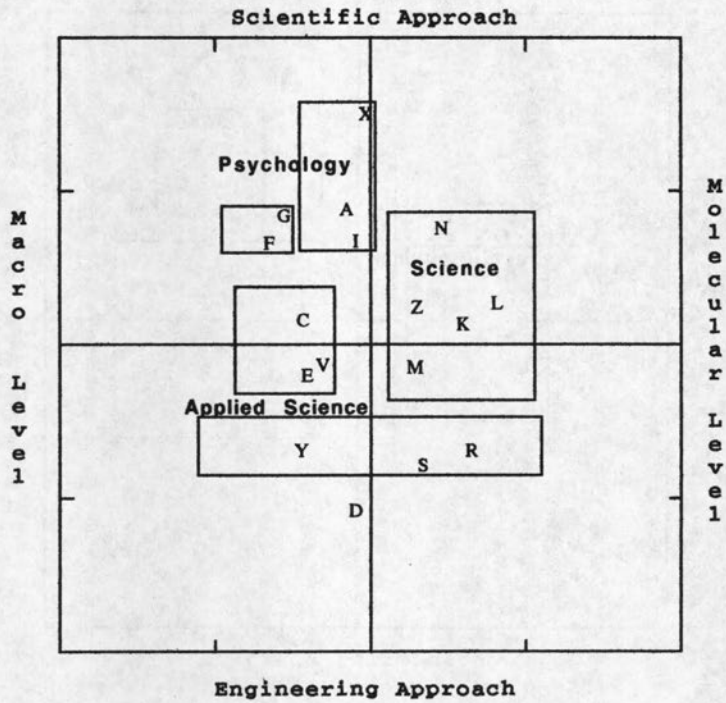


FIGURE 4
Clusters from Article Copy Service, June/December 1990 (2,380 Uses)

on this map. However, the similarities among the versions of the intellectual structure of this user community produced by the three different sources of data on reading patterns are striking.

Longitudinal Analysis of Library Data

Figures 4, 5, 6 and 7 show how the intellectual organization of the user community changed over a period of eighteen months. We believed that analyzing the library data would provide an appropriate longitudinal view of these changes. Repeated interviews would have provided comparable data, but they would have required considerable intrusion into the user community. In addition, the data from the library article photocopy service were more sensitive to small-scale changes in reading patterns than the citation data. One final consideration in this choice was the fact that library users were likely to be requesting materials to which they did not routinely have access (through personal subscriptions, for example). We thought that this made the library data more indicative of emerging interests, and particularly of cross-disciplinary interests.

It is possible to examine the evolution of the user community by considering each of the main clusters in turn. The Psychology cluster initially had two components, one more applied than the other. These two clusters eventually merged. The Science cluster has maintained a relatively consistent core of research groups, but there has been some migration back and forth between this cluster and the Applied Science clusters. Like the Psychology cluster, the Applied Science cluster has two components, which separated and combined at different points in time. It appears to be one of

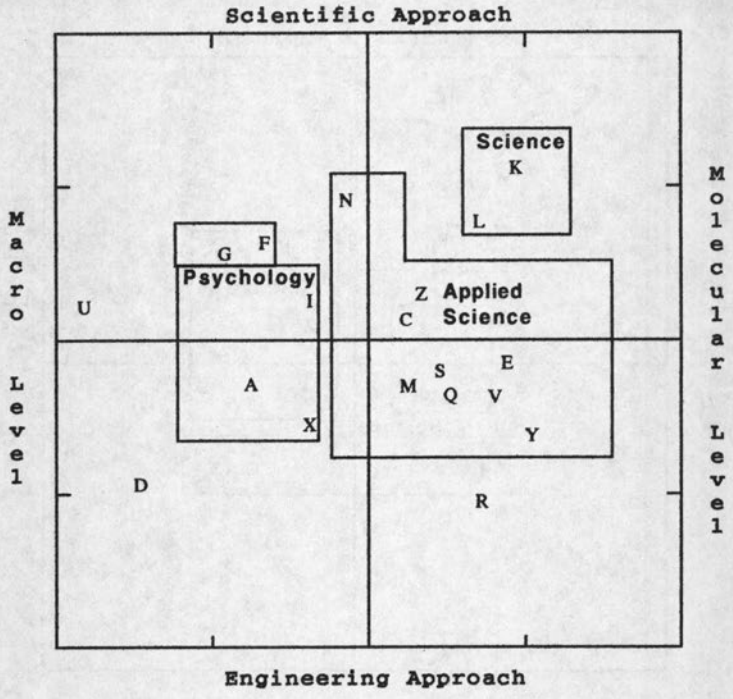


FIGURE 5
Clusters from Article Copy Service, January/May 1991 (2,410 Uses)

the more dynamic clusters, with groups shifting between the Applied Science and the Science cluster, although there is a relatively consistent core of groups. In summary, this user community exhibits a great deal of dynamism, which may be important in designing information services for the community.

Reading Patterns as Journal Clusters

Most libraries in North America use broad, general-purpose classification schemes to organize their collections and to assist in the identification and retrieval of information. Although such schemes have the advantage of being applicable to a large variety of library situations, sometimes they may be too inflexible to be used successfully in a specialized research institute. Analysis of the kind discussed here can provide an alternative for classification of library materials and for information retrieval in a specialized environment. In essence, the alternative classification emerges from an analysis of the extent to which scholars view titles as meeting the same information need. For example, the lists of journals developed for each research group from interview data were analyzed to produce similarity measures between journals. If scholars frequently cited the same two journals as relevant to their research interest, this indicated that the journals were similar in subject coverage. After similarity measures were calculated for all journals, multidimensional scaling and cluster analysis were used to produce a map of the journal literature.

Figure 8 shows the organization of journal titles revealed by the responses in interviews. Each dot represents a journal title, and journals that appear close

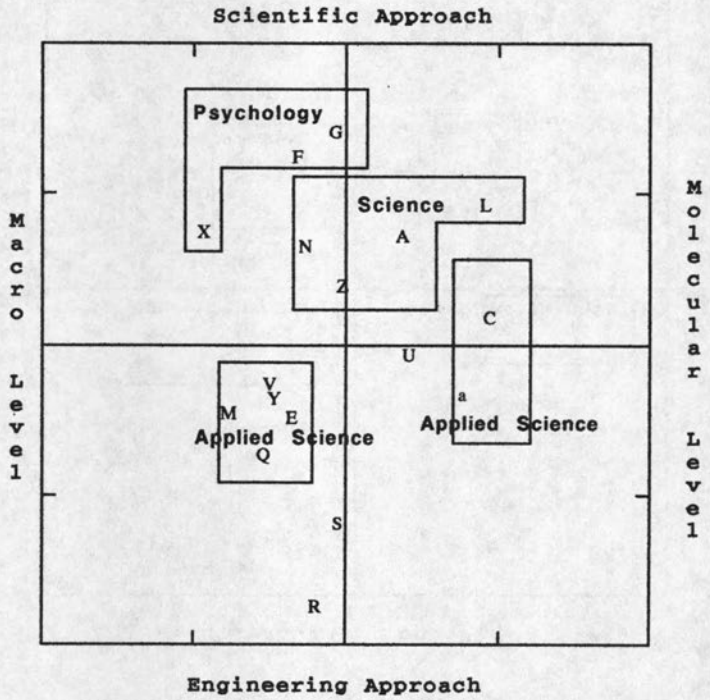


FIGURE 6
Clusters from Article Copy Service, May/August 1991 (2,248 Uses)

to each other were more likely to have been cited as being read frequently by the same scholars.

This journal map is similar in many respects to the maps of the intellectual structure of the user community. This is hardly surprising, since it is based on similar analysis of the data used to create the intellectual structure maps.

Simultaneous clustering of scholars and journals can provide a direct association between clusters of users and clusters of journals. This was done for the interview data, and table 2 provides an illustrative output. It shows (as one would expect), that Psychology journals are primarily associated with the Psychology cluster. More revealing is the nature of these journals. Rather than emphasizing the full range of journals in Psychology, this cluster of library users appears to be focusing upon physiologi-

TABLE 2
JOURNALS ASSOCIATED WITH THE PSYCHOLOGY CLUSTER

Behavioral and Brain Sciences
Cognition
Cognitive Psychology
Cognitive Science
Electronencephalography and Clinical Neurophysiology
Journal of Experimental Psychology: General
Journal of Experimental Psychology: Human Perception and Performance
Journal of Experimental Psychology: Learning, Memory and Cognition
Journal of Neuroscience
Neuropsychologia
Neuroscience
Psychological Review
Psychophysiology

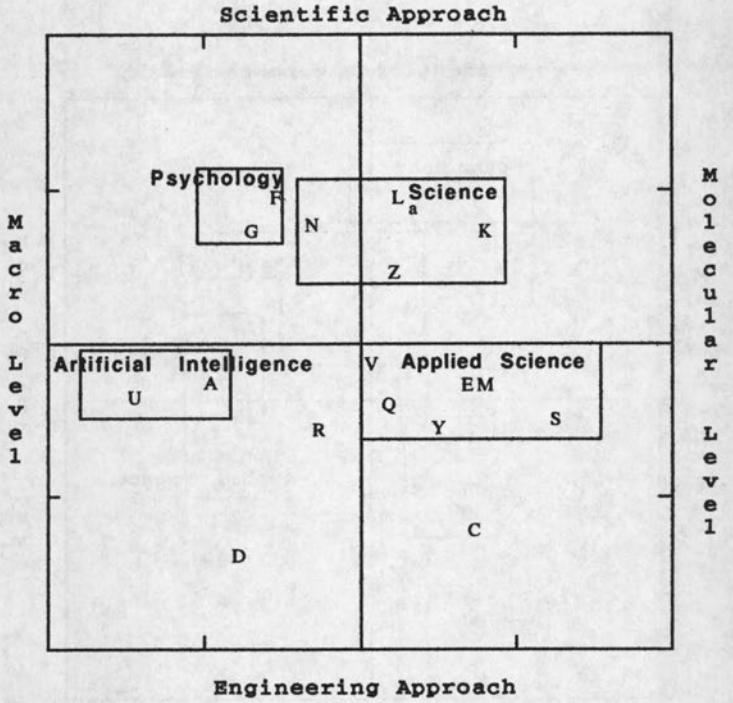


FIGURE 7
Clusters from Article Copy Service, September/December 1991 (3,273 Uses)

cal psychology and cognitive psychology. Details of this sort may be most useful in planning services such as SDI for segments of user communities.

SUMMARY OF THE MAPPING TECHNIQUE

The three methods of data collection used in this research identified an organizational pattern among the library user community associated with the Beckman Institute. Data from interviews with scholars, citation analysis, and patterns of use of one specialized library service contributed to this understanding of the user community. Each type of data collection had advantages and disadvantages, and differences among the data suggest that any librarian who wants to explore a user community should make use of more than one data source.

The data were collected, aggregated, and analyzed using a variety of microcomputer hardware and software that would be available to many academic librarians. The interview data were transcribed and entered into text files on IBM-PC clones. A utility program was written to scan each text file in turn and to aggregate answers to the same questions into a separate file. Data from this file were entered into a standard spreadsheet (in this case, MS Excel) to create the lists of journals identified by groups of scholars as being regularly used. Cosine similarity measures were calculated by a small program written in BASIC, although SPSS-PC+ could have been used. Multidimensional scaling and cluster analysis were done on the Macintosh version of SYSTAT, although SPSS-PC+ would have produced the same output.

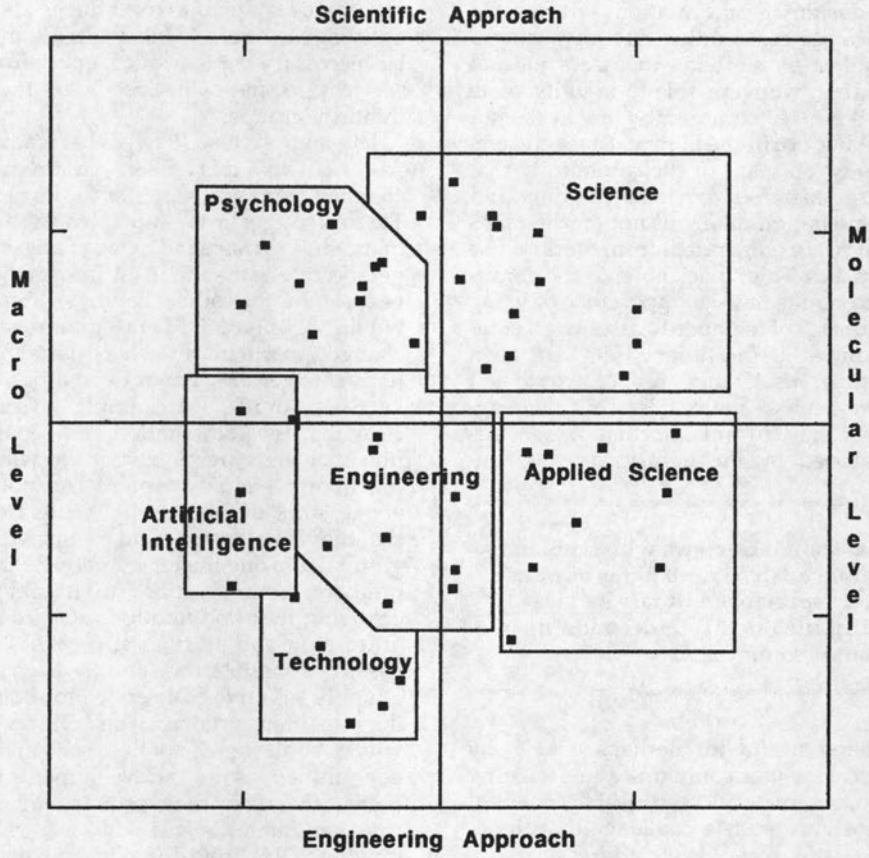


FIGURE 8
Journal Clusters from Interview Data

The citation data were downloaded from the online (DIALOG) version of *Social Science Citation Index* and the CD-ROM version of *Science Citation Index*. They were imported into an INFORMIX database, using a program written in C to convert the text files into structured files for entry into appropriate fields in the database. Because of available resources in the School where we were working, we used a UNIX version of INFORMIX, but this version is very similar to that available for the MS-DOS environment. Again, any programmable relational database on a microcomputer would be able to manage this data and produce the necessary output. Because off-the-shelf hardware and software were used in this project, and because only moderate computer, database, and statistical expertise were employed, the methods of data collection and analysis illustrated here could be adopted by many academic librarians who wish to explore the intellectual organization of their user communities.

CONCLUSIONS

In this section, we summarize the results of this investigation of the intellectual structure of the library user community from one interdisciplinary research institute, and suggest how these results might be taken into account

in designing information services for that user community. First, by using a number of methods to assess journal reading, we were able to identify parts of this user community that were not making use of the library. These clusters appear on maps of the community that were generated from interview data, and from citation data, but not on the maps that were generated from library use statistics. This "black hole" in the library data points out the importance of using a number of methods to assess user communities. If the library data had been used by itself, this absence would not have been as noticeable. This also suggests that current information services provided by the library are not considered useful (or perhaps usable) by part of the user community. Redesigning information services to meet the needs of these clusters is a challenge that the library staff may wish to address.

Data from interviews with scholars, citation analysis, and patterns of use of one specialized library service contributed to this understanding of the user community.

Another insight emerges from these maps. Some research groups were excluded from the high-level clusters that made up the intellectual structure of the community. Providing library service to outlying members of a user community can be another challenge for a library. Frequently, we establish services to meet the needs of the majority, and so tend to disregard the needs of the minority. One of the great values of this kind of analysis of intellectual structure of a user community is that it identifies minorities: small clusters and clusters of one. Equipped with an understanding of this intellectual structure, librarians are in a position to explore the special information needs of minority users, and to establish programs that meet those needs. In some cases, services that meet the needs of the main clusters in the community can be adapted to meet the needs of outlying members. In other cases, it may be necessary to consider specialized services to meet the needs of those minority groups.

This analysis also showed that reading patterns in this user community changed from one semester to the next. These changes were not always dramatic, and perhaps indicated changes in perspective rather than in information needs. On the other hand, a library would be ill-advised to ignore such changes, particularly when the short-term changes are shown to be a part of long-term trends. For example, it seems clear that the combination and separation of clusters are phenomena to which the library should respond. As noted above, some of this activity results from the movement of boundary-spanning groups from one cluster to another. Planning for library service to a rapidly changing user community seems to require new and flexible approaches. It would be possible, for example, to create a highly selective SDI service for boundary-spanning scholars. This SDI service would be designed to alert scholars to new initiatives and developments in fields other than their primary area of research interest. This kind of wide-ranging SDI is quite different from usual library services that are keyed to a narrow interest profile. A case can be made for a service that would identify important developments in all areas except the narrow area of subject interest of a user.

Some of the semester-to-semester changes in reading patterns result from the addition of new individuals and groups to the Beckman Institute, and from the departure of some individuals and groups from the user community. Thus this user community is dynamic in this sense as well as in the ways discussed above. The rate at which groups have come into the institute, and have begun to make full use of the facilities of the institute (including the library) has varied considerably. Therefore, library service must be flexible enough to meet the needs of a rapidly changing user community.

Finally, the classification of journal titles that emerged from this research could be used in conjunction with the maps of the high-level structure of the user community to provide specific services. For example, tables of contents from journals associated with user clusters could be routed to those users. Another use of this emergent classification might be in providing access to online searching. The databases that cover a cluster of journals could be made directly available to users from the associated user cluster, while databases covering other journal clusters might be made available primarily in an intermediated mode to those users. We do not mean to suggest that this kind of classification is useful for organizing the library's collection. Because it emerges from a dynamic intellectual organization of the user community, the classification is likely to change too quickly to allow its use for an essentially static function such as the organization of the library collection. Rather, it is of greatest use in the organization of services such as database searching or SDI, whether or not such services make direct use of a particular collection. In addition, emergent classifications of this sort may serve to point out to scholars relationships between research topics of which they were not initially aware.

Equipped with an understanding of this intellectual structure, librarians are in a position to explore the special information needs of minority users, and to establish programs that meet those needs.

In summary, analyzing the intellectual structure of the user community can provide important insights about how that community functions, and accordingly about how its information needs might be met. We believe that this type of mapping is within the technical capabilities of many academic librarians, and that it can be useful to them as they consider the difficult issues associated with providing information services to an interdisciplinary research institute.

REFERENCES AND NOTES

1. Leon Shkolnik, "The Continuing Debate over Academic Branch Libraries," *College & Research Libraries* 52(July 1991): 343–51.
2. Julie M. Hurd, "Interdisciplinary Research in the Sciences: Implications for Library Organization," *College & Research Libraries* 53(July 1992): 283–97.
3. Paul Metz, *The Landscape of Literatures: Use of Subject Collections in a University Library*, ACRL Publications in Librarianship, no. 43 (Chicago: ALA, 1983).
4. Harry Llull, "Meeting the Academic and Research Information Needs of Scientists and Engineers in the University Environment," *Science & Technology Libraries* 11(Spring 1990): 83–90.
5. Hurd, "Interdisciplinary Research in the Sciences."
6. Katherine W. McCain, "Cocited Author Mapping as a Valid Representation of Intellectual Structure," *Journal of the American Society for Information Science* 37(1986):111–22.
7. Katherine W. McCain, "Mapping Authors in Intellectual Space: A Technical Overview," *Journal of the American Society for Information Science* 41(1990): 360–68.
8. Henry Small and E. Sweeney, "Clustering the Science Citation Index Using Co-Citations I: A Comparison of Methods," *Scientometrics* 7(1985):393–409.

The Readability of Published, Accepted, and Rejected Papers Appearing in *College & Research Libraries*

Cheryl Metoyer-Duran

This study examined the readability of papers that College & Research Libraries accepted, rejected, and published for 1990 and 1991. In addition to showing a statistically significant difference for the text of papers, but not for the abstracts, this investigation reports topics for further investigation and presents a procedure for others to follow in replicating the study.

Individuals conducting action research and evaluation studies, and wanting library managers to use the findings of these studies to produce change within the organization, must fit "information presentation formats to decision-making."[1] Clearly, researchers and scholars must know the audience with whom they intend to communicate. A research paper that is difficult to read and comprehend is not likely to be read (and presumably published). Readability offers insights into communication in that it addresses whether an audience will "understand" a paper, read it "at optimum speed," and "find it interesting."[2] Readability, therefore, is one indication of the effectiveness of a piece of writing in conveying the author's intended message to the audience.[3]

READABILITY FORMULAE

As Marie J. Abram observes,

> The style of writing (or how the content of the writing is stated) can be measured in such a way that a numerical value can be assigned to each writing style. This qualification of style is an entirely separate dimension from the content of the writing. The numerical value that results from the measurement of style quantifies the ease or difficulty of the writing. With most formulas this numerical value has been translated into an educational skill level associated with the material (i.e., . . . ninth grade level . . .).[4]

Abram further observes that "many readability formulas exist."[5]

Three of the better-known formulae, all of which are available on Grammatik (Reference Software International, San Francisco), include the Flesch Reading Ease, Gunning's Fog Index, and the Flesch-Kincaid Grade Level. Each considers the average number of words per sentence and the average number of syllables per word.[6]

Both the Gunning's Fog Index and the Flesch-Kincaid Grade Level formula measure level of education necessary to understand a source, or paper. The level of difficulty of a source increases as the grade level advances. Because scholarly literature requires a higher level of understanding and attracts a specialized

Cheryl Metoyer-Duran is the Rupert Costo Chairholder in American Indian History, Departments of History and Anthropology, College of Humanities and Social Sciences, University of California, Riverside, California 92521-0132.

audience, a higher readability score may be acceptable up to a certain threshold. The Flesch Reading Ease score falls along a scale ranging from 0 to 100, with lower scores suggesting a more difficult to read source(s).[7]

In interpreting the Flesch-Kincaid Grade Level and Gunning's Fog Index, a researcher can equate increased readability with a lower grade level. However, application of the Flesch Reading Ease measure equates a higher level of readability with a higher (i.e., less difficult) score.

THE STUDY

The articles and features appearing in *College & Research Libraries* presumably require a higher level of education to understand than articles and features appearing in less scholarly and less research-oriented journals. Two questions are: "On an average, what are the levels of readability for the articles and features contained in specific scholarly and research journals?"; and "Has readability changed over time?" These questions, together with matters of journal content and policy, are most appropriate for an editor, editorial board, and publisher to address, especially in these times of information source proliferation and fiscal stringencies. Formal and informal readership surveys ensure that journals understand subscriber and reader preferences and learn about these individuals and organizations. Clearly, readability is an important variable to investigate and address, especially if editorial staff and authors rewrite papers to accommodate a specified level of readability.

The readability of scholarly or refereed journals might be examined from another perspective. Is there a difference in readability between accepted and rejected manuscripts? Because the editorial staff of *College & Research Libraries* copyedits all accepted manuscripts, two directional hypotheses might be ventured:

- The text of published papers is more readable than that of either accepted or rejected papers, and the text of accepted papers is more readable than that of rejected papers; and
- The abstracts of published papers are more readable than those of either accepted or rejected papers, and the abstracts of accepted papers are more readable than those of rejected papers.

A basic assumption in this study is that most, if not all, of the papers reflect at least a college level education. However, there is a point at which a higher level of difficulty suggests less readability. In effect, there are different shades of difficulty, ranging from most difficult to read (rejected papers) to less difficult (accepted but uncopyedited papers) and least difficult to read (published papers). The Flesch-Kincaid and the Gunning's Fog Index will indicate differences in grade levels among the three categories of papers—accepted, rejected, and published. At the same time, the Flesch reading ease score will show differences in the level of reading difficulty.

RESEARCH DESIGN

The editor of *College & Research Libraries* supplied the investigator with copies of all manuscripts accepted and rejected during 1990 and 1991, excluding the names of the authors and associated editorial correspondence. During these two years, 82 refereed papers appeared in print, 70 papers were accepted but not yet published, and 119 were rejected.

Given the hypotheses and the large size of a sample necessary to achieve a precision of + 5, with 95 percent confidence, the investigator examined all 271 papers and did not draw a sample. The research design necessary to investigate the study's hypotheses required analysis of each abstract and a random paragraph sampling, including the first and final paragraph of each paper. The investigator numbered the unique paragraphs in each paper and, after counting the number of paragraphs, consulted the Appendix to select the actual paragraphs for word processing and statistical analysis.[8] (The Appendix has been reprinted in part to aid other researchers who intend to do readability studies but who do not want to develop their own schema.)

Some 9 accepted and 26 rejected papers did not contain abstracts. An ex-

TABLE 1
GRADE LEVEL OF THE TEXT AND ABSTRACTS

	Flesch-Kincaid		Gunning's Fog Index	
	Mean	Median	Mean	Median
Five-paragraph text				
a. Rejected papers	14.34	14	18.48	19
b. Accepted papers	15.27	15	19.41	19
c. Published papers	15.16	15	19.21	19
Abstracts				
a. Rejected papers	16.69	16	21.36	21
b. Accepted papers	16.38	16	21.08	21
c. Published papers	16.49	17	21.07	21

perienced word processor input the abstracts and text of the five paragraphs for each published, accepted, and rejected paper, exactly as presented in the submitted or published paper, including spelling, punctuation, and grammatical errors. The investigator verified the accuracy of data entry, ran the Grammatik software on each word-processed abstract and five-paragraph file, and computed the scores for the Flesch-Kincaid Grade Level, Gunning's Fog Index, and Flesch Reading Ease.[9] Next, the scores were entered into StatPac Gold (Walonick Associates, Inc., Minneapolis), a statistical analysis software package, and statistical analyses were performed to examine the hypothesis.

LIMITATIONS

The study does not examine the reviewing process, the comments of referees, and the decision rendered by the editor. An unaddressed question is "To what extent does readability affect the decision to accept a paper for publication?" Papers reviewed prior to 1990 were not examined, nor were papers submitted in 1991 for which an editorial decision was not rendered that year.

Abram cautions that sentence length and word factors "do not cause reading ease/difficulty. Rather they are highly correlated with reading ease/difficulty. As such these variables can be used as indicators of changes that would reduce reading difficulty."[10] Highly readable writing may at times be boring to read because simple sentences may not fully convey the complexities of ideas expressed in scholarly writing.[11]

FINDINGS

Table 1 depicts the grade level for both the five paragraphs from the papers and the abstracts. Although every indicator suggests a readability level of at least college, the Gunning's Fog Index produces higher scores than does the Flesch-Kincaid Grade Level. Both measures do not consider the same number of syllables per word (see note 6).

Readability . . . is one indication of the effectiveness of a piece of writing in conveying the author's intended message to the audience.

It appears that the first hypothesis concerning readability of papers is not supported since the scores for published and accepted papers are higher than those of rejected texts. Without applying the higher-ordered statistical tests used in the next section of this paper, the second hypothesis regarding the abstracts appears to be partially supported, as rejected abstracts score higher than published or accepted abstracts. The table further indicates that abstracts require a higher level of readability than do the extracts from the text.

TABLE 2
FLESCH READING EASE SCORES

	Mean	Median	Low to High Score
Five-paragraph text			
a. Rejected papers	30.77	31	9 to 53
b. Accepted papers	28.04	28	7 to 45
c. Published papers	27.56	29	1 to 46
Abstracts			
a. Rejected papers	18.43	18	0 to 47
b. Accepted papers	17.85	16	0 to 44
c. Published papers	17.93	17	0 to 50

TABLE 3
MATRIX DEPICTING CORRELATIONS AND *T*-STATISTICS

	Flesch Reading Ease		Gunning's Fog Index		Flesch-Kincaid Grade Level	
	Correlation	*t*-statistics	Correlation	*t*-statistics	Correlation	*t*-statistics
*Five-paragraph text:**						
a. Accepted/ rejected papers	.141	40.714	–.195	84.788	–.216	69.136
b. Accepted/ published papers	–.027	32.842	–.048	66.402	–.064	51.774
c. Rejected/ published papers	–.164	36.877	.159	91.711	.169	74.426

*The following Pearson's Product-Moment Correlations and *t*-statistics are all significant ($p < .05$).

In table 2, the section on "low to high score" confirms that both the text and abstracts are "difficult" to "very difficult" to read. However, beyond this simple statement, tables 1 and 2 are not comparable. The measures of grade level do not coincide with the categories represented in the Flesch Reading Ease. The latter measure does not differentiate among precise years of college education. The data in table 2 do not appear to support either hypothesis.

Hypothesis Testing

Perusal of table 1 might suggest that the text of rejected papers has an appreciably lower reading level than does the text of accepted and published papers. Using analysis of variance (ANOVA) and the *t*-test, the investigator more closely examined the hypotheses concerning the text and abstracts of rejected, accepted, and published papers. The ANOVA for the five-paragraph text indicated statistical significance according to the Flesch Reading Ease ($F = 3.4932$, $p < .05$), Gunning's Fog Index ($F = 4.7315$, $p < .05$), and Flesch-Kincaid Grade Level formula ($F = 5.7098$, $p < .05$). However, no statistical significance emerged for abstracts (Flesch Reading Ease, $F = .0539$, $p > .05$; Gunning's Fog Index, $F = .1772$, $p > .05$; and Flesch-Kincaid, $F = .1962$, $p > .05$).

The *t*-test indicates that regardless of the readability measure there is a statistically significant difference among the sample of five-paragraph texts for the three groups depicted in table 3. Although the texts of articles reflect a scholarly level of readability, there are significant differences. Because rejected papers are the most readable using the three measures, the first hypothesis is not supported.

In the case of the abstracts, the ANOVA, as already discussed, did not

disclose statistically significant differences for any readability measure. The *t*-test, as well, did not identify significant differences. Therefore, the second hypothesis is not supported. Abstracts for rejected, accepted, and published papers are all difficult to read. Tables 1 and 2 support this finding.

TOPICS MERITING INVESTIGATION

The readability of texts and abstracts merits further examination. An interesting question is: Why were rejected papers the most readable? Presumably, the copyediting of accepted papers results in a more readable published paper. However, further analysis of this question is needed. It is important to understand the readability of abstracts, as well as their content and form.[12] If one function of an abstract is to entice readership of a paper, the level of difficulty might be decreased.

This study might be duplicated using submitted and published papers for more than a two-year span. Both hypotheses might be tested using other journals, scholarly and perhaps popular as well. Instead of limiting data collection and analysis to a quantifiable technique, researchers might explore focus group interviews and other methods of qualitative data collection to obtain a complementary understanding of readability and subscriber preferences.

CONCLUSION

As journals strive to better address the interests and needs of their readership and to expand the number of readers and subscribers, readability becomes an important variable. As the reading level of the general public and perhaps some specialized publics declines, and as librarians and others become busier and read a smaller percentage of their professional literature, readability might be linked with "browse-ability" and, therefore, scholarly journals should strive for an easier level of reading difficulty and changes in presentation format. With increased interest in electronic publishing, two important questions become: "What is the readability of electronic journals?" and "Is there a difference in readability between electronic and nonelectronic journals?" More papers and scholarly journals, regardless of the medium in which they appear, might aim for the "fairly difficult" or "difficult" as opposed to the "very difficult" level on the Flesch Reading Ease (see note 7).[13]

The readability of texts and abstracts merits further examination. An interesting question is: Why were rejected papers the most readable?

REFERENCES AND NOTES

1. C. R. Bybee, "Fitting Information Presentation Formats to Decision-Making," *Communication Research* 8 (July 1981): 343–70.
2. Edgar Dale and Jeanne Chall, "The Concept of Readability," *Elementary English* 26 (Jan. 1949): 23.
3. Chaffai Tekfi, "Readability Formulas: An Overview," *Journal of Documentation* 43 (Sept. 1987): 262.
4. Marie J. Abram, "Readability: Its Use in Adult Education," *Lifelong Learning: The Adult Years* 4 (Jan. 1981): 8.
5. Ibid.
6. The Flesch Reading Ease formula considers the average number of words per sentence and the number of syllables per 100 words. Gunning's Fog Index includes the average number of words per sentence and the number of words of three or more syllables. The Flesch-Kincaid Grade Level formula examines the average number of words per sentence and the average number of syllables per word.

7. The scoring categories for the Flesch Reading Ease are as follows:

Score	Reading Difficulty	Grade Level
90–100	Very easy	4th grade
80–90	Easy	5th grade
70–80	Fairly easy	6th grade
60–70	Standard	7th–8th grade
50–60	Fairly difficult	Some high school
30–50	Difficult	High school and college
0–30	Very difficult	Minimum of college

8. The instructions for sampling paragraphs were as follows:
   a. Mark paragraphs in the article which cannot be measured due to special characters or whatever.
   b. Number the remaining paragraphs from one to *n*.
   c. Using *n* as the total number of paragraphs in a paper, turn to the Appendix and find that number. Then, select those five paragraphs for word processing. For papers having five or fewer paragraphs, take all the paragraphs.
   d. Assign each paper a unique ID number and indicate whether the paper has been accepted, published, or rejected.
9. For reliability purposes, readability scores were computed using RightWriter (Que Software, Carmel, Ind.), a software package similar to Grammatik, and compared to the scores generated using Grammatik. There were no differences in the scores.
10. Abram, "Readability," p.9.
11. Robert Calfee and Priscilla Drum, "Research on Teaching Reading." in *Handbook of Research on Teaching*, ed. Merlin C. Wittrock (New York: Macmillan, 1986), 804–49.
12. See Tibor Koltay, "The Structure of Medical Papers and Their Author-Abstracts," *Health Information and Libraries* 1(1990): 55–60; Milica Milas-Bracovic and Jasenka Zajec, "Author Abstracts of Research Articles Published in Scholarly Journals in Croatia (Yugoslavia): An Evaluation," *Libri* 39 (Dec. 1989): 303–18; Timothy C. Craven, "Sentence Dependency Structures in Abstracts," *Library & Information Science Research* 10 (Oct./Dec. 1988): 401–10 ; Elizabeth Liddy, Susan Bonzi, and Jeffrey Katzer, "A Study of Discourse Anaphora in Scientific Journals," *Journal of the American Society for Information Science* 38 (July 1987): 255–61; and Elizabeth Liddy, "The Discourse-Level Structure of Empirical Abstracts: An Exploratory Study," *Information Processing & Management* 27(1991): 55–81.
13. It is interesting to note that this paper scored the following on the three readability measures:

	Five-Paragraph Text	Abstract
Flesch Reading Ease:	24	5
Gunning's Fog Index:	19	23
Flesch-Kincaid Grade Level:	16	20

APPENDIX
SELECTION OF FIVE PARAGRAPHS FROM A PAPER

No. of Paragraphs	First	Second	Third	Fourth	Fifth
6	1	2	3	5	6
7	1	2	4	5	7
8	1	2	4	6	8
9	1	2	5	7	9
10	1	3	5	8	10
11	1	3	6	8	11
12	1	3	6	9	12
13	1	3	7	10	13
14	1	4	7	11	14
15	1	4	8	11	15
16	1	4	8	12	16
17	1	4	9	13	17
18	1	5	9	14	18
19	1	5	10	14	19
20	1	5	10	15	20
21	1	5	11	16	21
22	1	6	11	17	22
23	1	6	12	17	23
24	1	6	12	18	24
25	1	6	13	19	25
26	1	7	13	20	26
27	1	7	14	20	27
28	1	7	14	21	28
29	1	7	15	22	29
30	1	8	15	23	30
31	1	8	16	23	31
32	1	8	16	24	32
33	1	8	17	25	33
34	1	9	17	26	34
35	1	9	18	26	35
36	1	9	18	27	36
37	1	9	19	28	37
38	1	10	19	29	38
39	1	10	20	29	39
40	1	10	20	30	40
41	1	10	21	31	41
42	1	11	21	32	42
43	1	11	22	32	43
44	1	11	22	33	44
45	1	11	23	34	45
46	1	12	23	35	46
47	1	12	24	35	47
48	1	12	24	36	48
49	1	12	25	37	49
50	1	13	25	38	50
51	1	13	26	38	51
52	1	13	26	39	52
53	1	13	27	40	53

(continued)

APPENDIX (continued)

No. of Paragraphs	First	Second	Third	Fourth	Fifth
54	1	14	27	41	54
55	1	14	28	41	55
56	1	14	28	42	56
57	1	14	29	43	57
58	1	15	29	44	58
59	1	15	30	44	59
60	1	15	30	45	60
61	1	15	31	46	61
62	1	16	31	47	62
63	1	16	32	47	63
64	1	16	32	48	64
65	1	16	33	49	65
66	1	17	33	50	66
67	1	17	34	50	67
68	1	17	34	51	68
69	1	17	35	52	69
70	1	18	35	53	70
71	1	18	36	53	71
72	1	18	36	54	72
73	1	18	37	55	73
74	1	19	37	56	74
75	1	19	38	56	75
76	1	19	38	57	76
77	1	19	39	58	77
78	1	20	39	59	78
79	1	20	40	59	79
80	1	20	40	60	80
81	1	20	41	61	81
82	1	21	41	62	82
83	1	21	42	62	83
84	1	21	42	63	84
85	1	21	43	64	85
86	1	22	43	65	86
87	1	22	44	65	87
88	1	22	44	66	88
89	1	22	45	67	89
90	1	23	45	68	90
91	1	23	46	68	91
92	1	23	46	69	92
93	1	23	47	70	93
94	1	24	47	71	94
95	1	24	48	71	95
96	1	24	48	72	96
97	1	24	49	73	97
98	1	25	49	74	98
99	1	25	50	74	99
100	1	25	50	75	100
101	1	25	51	76	101
102	1	26	51	77	102
103	1	26	52	77	103
104	1	26	52	78	104
105	1	26	53	79	105
106	1	27	53	80	106
107	1	27	54	80	107

No. of Paragraphs	First	Second	Third	Fourth	Fifth
108	1	27	54	81	108
109	1	27	55	82	109
110	1	28	55	83	110
111	1	28	56	83	111
112	1	28	56	84	112
113	1	28	57	85	113
114	1	29	57	86	114
115	1	29	58	86	115
116	1	29	58	87	116
117	1	29	59	88	117
118	1	30	59	89	118
119	1	30	60	89	119
120	1	30	60	90	120
121	1	30	61	91	121
122	1	31	61	92	122
123	1	31	62	92	123
124	1	31	62	93	124
125	1	31	63	94	125
126	1	32	63	95	126
127	1	32	64	95	127
128	1	32	64	96	128
129	1	32	65	97	129
130	1	33	65	98	130
131	1	33	66	98	131
132	1	33	66	99	132
133	1	33	67	100	133
134	1	34	67	101	134
135	1	34	68	101	135
136	1	34	68	102	136
137	1	34	69	103	137
138	1	35	69	104	138
139	1	35	70	104	139
140	1	35	70	105	140
141	1	35	71	106	141
142	1	36	71	107	142
143	1	36	72	107	143
144	1	36	72	108	144
145	1	36	73	109	145
146	1	37	73	110	146
147	1	37	74	110	147
148	1	37	74	111	148
149	1	37	75	112	149
150	1	38	75	113	150
151	1	38	76	113	151
152	1	38	76	114	152
153	1	38	77	115	153
154	1	39	77	116	154
155	1	39	78	116	155
156	1	39	78	117	156
157	1	39	79	118	157
158	1	40	79	119	158
159	1	40	80	119	159
160	1	40	80	120	160
161	1	40	81	121	161

(continued)

APPENDIX (continued)

No. of Paragraphs	First	Second	Third	Fourth	Fifth
162	1	41	81	122	162
163	1	41	82	122	163
164	1	41	82	123	164
165	1	41	83	124	165
166	1	42	83	125	166
167	1	42	84	125	167
168	1	42	84	126	168
169	1	42	85	127	169
170	1	43	85	128	170
171	1	43	86	128	171
172	1	43	86	129	172
173	1	43	87	130	173
174	1	44	87	131	174
175	1	44	88	131	175
176	1	44	88	132	176
177	1	44	89	133	177
178	1	45	89	134	178
179	1	45	90	134	179
180	1	45	90	135	180
181	1	45	91	136	181
182	1	46	91	137	182
183	1	46	92	137	183
184	1	46	92	138	184
185	1	46	93	139	185
186	1	47	93	140	186
187	1	47	94	140	187
188	1	47	94	141	188
189	1	47	95	142	189
190	1	48	95	143	190
191	1	48	96	143	191
192	1	48	96	144	192
193	1	48	97	145	193
194	1	49	97	146	194
195	1	49	98	146	195
196	1	49	98	147	196
197	1	49	99	148	197
198	1	50	99	149	198
199	1	50	100	149	199
200	1	50	100	150	200

CD-ROMs in Academic Libraries: A Survey

John M. Budd and Karen A. Williams

The present study seeks to ascertain the current usage and status of CD-ROM products in academic libraries. The survey asks how many products libraries own or subscribe to, how these are paid for, which titles are held, and how many workstations are supported. Libraries are also asked about usage and cost of CDs. Related areas are also investigated. Questions are asked regarding online search activity and expenditures for the years 1989–1990 and 1984–1985; statistical tests are employed to determine if there has been a significant change in these categories over the time period in question. Finally, libraries are asked if they have canceled print sources as a result of online or CD availability.

In the last few years academic libraries have embraced compact disc technology as a means of providing information services to their clientele. Librarians have long recognized the limitations of print sources, such as indexes and abstracts. These print sources are linear in nature, so that a library user has to move forward and backward within or among volumes in order to retrieve information. Users are also, by and large, limited to searching only one descriptor or index term at a time. Over the last few years online access to databases has provided librarians and users with greater search flexibility. However, the pricing structure of many of the available databases and the budgetary vagaries of trying to reconcile anticipated use and possible costs have proved to be obstacles to the use of online services. Expansion of CD-ROMs as information storage and retrieval mechanisms has presented another option for providing services in libraries. The number of available products has grown as the library market has demonstrated a willingness to adopt them as acquisitions and subscriptions.

As CDs entered libraries, articles on the organization and management of services based on the medium began to appear.[1] Harter and Jackson attempted to pinpoint the major issues surrounding any optical disc system in a library:

- databases
- search system characteristics
- end-user searching and effectiveness
- education and training
- staffing
- costs
- funding[2]

There is evidence of an awareness that CD-ROM has significantly changed the way in which library users access information. Patrons have quickly and enthusiastically adopted the technology as an exciting alternative to print and online, appreciating the convenience, ease of use, and greater degree of control over the search process that the medium offers.[3]

User affinity for the product is borne out to some extent by a survey conducted at

John M. Budd is at the School of Library & Informational Science, University of Missouri–Columbia, Columbia, Missouri 65211. Karen A. Williams is Team Leader for the Social Science Team, University of Arizona, Tucson, Arizona 85721.

Columbia University. Juhl and Lowry report:

> In Butler Reference, 34 percent of our respondents found that a specific CD-ROM product was essential to their research, 75 percent found the CD-ROM version of an index easier to use than its printed counterpart, and 71 percent preferred the CD-ROM format to paper.[4]

Probably the most important issue for librarians is the cost of CDs. Since CDs do not constitute a service with costs as widely variable as online databases, they usually are not treated in the same manner as online services are handled. At the same time, they frequently are not treated exactly in the way print sources are, because of the accompanying hardware considerations. Additionally, maintaining printers for public use means costs for paper and related supplies. Another concern Johnson points out is that there is the likelihood of necessary duplication of CD and print sources, at least in the short term.[5] This puts added pressure on already stretched library budgets. Perhaps because of the limitations on organizational budgets there exists what Beltran perceives as the fear "that increased support for automated information sources is likely to come from funds supporting disciplines in which automated systems are less available and important."[6] The pressure has resulted in a cooperative effort such as that in Pennsylvania, where PALINET has assisted libraries in obtaining both hardware and the CD products themselves at discounted prices for member libraries.[7] The phenomena of increased use and demand and concomitant costs present a dilemma for libraries and, at present, there is a dearth of data on both activity and funding options. Despite the paucity of information, there is considerable interest in the subject, as indicated by exchanges via electronic mail and electronic bulletin boards.

THE PRESENT SURVEY

The above issues relating to acquisitions of CD products and financing the products and services form the focus of a survey of academic libraries, conducted in 1991. The purpose of the survey is to gather data on libraries' applications of CDs in their informational services. In addition, the survey seeks to determine what has happened with online search activities and expenditures over the last several years and whether online and CD services have affected the holdings of print sources. The questions are designed to ascertain the extent of libraries' holding of CD products and what sources are commonly held by the libraries. They also ask about expenditures on these products and where the funds come from for purchase or subscription. Most of the data requested is from the 1989–1990 fiscal year. Where comparative information of any sort is sought, questions are based on the 1984–1985 year as well.[8]

Probably the most important issue for librarians is the cost of CDs.

The authors decided that the population of academic libraries would have to be limited, since resources precluded surveying all libraries. Also, since CD-ROM products and related equipment require substantial financial commitment by libraries, only those libraries with budgets large enough to accommodate the medium would be included. Fortunately, there are sets of institutions which fit this criterion and assure representation from a wide geographic area and from both public and private schools. The population surveyed was comprised of the members of the Association of Research Libraries and the ACRL University Libraries (as determined by the Association of College and Research Libraries). In order to avoid problems of overall governance, availability of products, and currency exchange rates, only United States libraries were surveyed. Additionally, only those libraries with total materials expenditures of at least $500,000 were included. This resulted in a survey of 180 libraries. A total of 113 libraries (62.7 percent) returned questionnaires with at least some

of the questions answered. Local data collection did not allow for response to every question by every library returning the questionnaire.

The survey is designed to yield primarily descriptive results, since there is very little baseline data with which to compare responses. For this reason, the survey questions themselves form the research questions underlying this study, for the most part. Where comparative information is requested, there is the possibility for some hypothesis testing. The working hypotheses are that the difference between 1984–1985 data and 1989–1990 data is statistically significant ($p < .05$) with regard to changes in numbers of mediated online searches and expenditures on those searches. These will be tested as null hypotheses. The survey is also limited to the "academic" libraries on each campus; that is, it excludes law and medical (or health sciences) libraries. The reason for this limitation is that some of these libraries are in locations remote from the main campuses and many of the law and medical libraries are administratively separate from the academic library systems.

FINDINGS

Libraries reporting data relevant to this study cannot provide information regarding every question, due to some vagaries of local record keeping. This in itself indicates a potential problem area in library management. At times libraries have a tendency to make decisions about costly products and services with inadequate information. The first survey question begins with the most basic information—the number of products to which the library subscribes. A total of 112 libraries responded to this question and the mean response is 19.1 products. The next question focuses on the number of workstations in each library. The mean for the 110 responding libraries is 14.1 workstations.

The third question asks, specifically, to which indexing and abstracting products libraries subscribe. Some choices are made available on the questionnaire, along with space provided for respondents to include additional products. Responding libraries offer a considerable variety of titles; in fact, 104 unique titles receive at least one mention each. Some titles are quite widely held; the ten most frequently used products are listed in table 1.

TABLE 1
TEN MOST FREQUENTLY SUBSCRIBED TO INDEXING AND ABSTRACTING PRODUCTS

Title	No.
PsychLit	96
ERIC	92
ABI/Inform	74
MLA Bibliography	62
GPO's File	56
Medline (in academic libraries only)	56
Dissertation Abstracts Ondisc	46
Sociofile	45
Infotrac	40
Agricola	34

The list holds few, if any, surprises for reference librarians. The CD titles listed represent areas of traditional information needs in academic libraries.

At times libraries have a tendency to make decisions about costly products and services with inadequate information.

Next, libraries are asked how the indexing and abstracting titles are financed. The choice of responses includes the mention of alternatives available locally. A total of seventy-four libraries indicates that the serials budget is the source of financing CD-ROMs. The second most frequently occurring source of funding is the reference budget, so noted by twenty-eight libraries. The following sources also provide financing, with the number of responding libraries in parentheses: monographic budget (13), separate CD budget (11), automation budget (8), grants (3), special funds (3), gift money (2), general materials budget (1), one-time legislative appropriation (1), and online search budget (1).

Eighty-eight libraries are also able to provide information on how much is spent each year on indexing and abstracting titles. On average, these libraries spend $36,550. The next question seeks to determine the number of uses of these indexing and abstracting products in 1989–1990. Only thirty-five libraries were able to respond to this question. The mean number of patron uses for these responding libraries is 15,988. While few libraries maintain data on usage (and accurate counts of uses, even when sign-up sheets are used and monitoring is attempted, is very difficult), the responses to these two questions invite calculation of average cost per use. If the average amount spent on the products is divided by the average number of uses, the result is $2.29 per use. One library offers its estimate of cost per use; it figures that CD-ROM searches cost about 75 cents each, while the cost for other automated resources is $13.80 per search. These figures, which may not be a usable representation of cost per use, are deceptive. There are other costs attached to the use of CD-ROMs, such as hardware expenditures (even if amortized), paper and other supplies, and possibly the librarian's time to assist users. Future research on the reference process may focus on sampling the use of CDs and print sources in an attempt to discover cost-per-use comparisons.

Indexing and abstracting titles are not the only products libraries subscribed to or purchased. The next question asks to which nonbibliographic sources on CD-ROM libraries subscribe. Again, some choices are provided to respondents, but they are free to add any other titles they receive. There are even more nonbibliographic titles in libraries' repertoires than indexing and abstracting titles. Libraries report holding 136 unique titles; further, there is greater dispersion of holdings, with fewer titles being widely held by libraries. The most frequently subscribed to source is *Compact Disclosure*, held by forty-three libraries. The next four titles in order of frequency of subscription are: *BIP Plus* (31 libraries), *Oxford English Dictionary* (23), *Academic American Encyclopedia* (18), and *Ulrich's Plus* (15). The number of titles held by libraries is likely to increase in the near future; government document depository libraries expect more and more government information to be produced on CD-ROM.

The libraries were asked how the nonbibliographic products are funded. The four most frequently mentioned sources are identical to the sources of financing noted for indexing and abstracting titles, though the order is slightly different. Other, less frequently occurring sources vary a bit from the above. The list of sources is as follows, with the number appearing in parentheses: serials budget (32), monographic budget (28), reference budget (22), separate CD budget (7), endowment funds (3), automation budget (3), gift money (2), special materials budget (1), media budget (1), soft money (1), and teaching materials budget (1). The primary difference between funding sources for these types of CD products and the indexing and abstracting titles is the number reporting the monographic budget; nonbibliographic products are less frequently classified as serials.

Future research will have to address the trade-offs when libraries opt for one storage and retrieval medium over another.

Related to the purpose of this study is the examination of online search activity both during the survey period and in the recent past. Eighty-seven libraries offer information on the number of mediated searches in 1989–90. The mean number of searches for the libraries is 1,698. This figure is deceptive, however, since one reporting library states that 70,172 searches were performed in that year. If data are smoothed and this response is ignored, the mean for the remaining eighty-six libraries is 902. For the year 1984–1985 the seventy-six responding libraries yield a mean number of searches of 1,320. One library mentions that the number of mediated searches in the sciences is masking the

TABLE 2
MOST FREQUENTLY CANCELED PRINT TITLES
DUE TO CD-ROM AVAILABILITY

Title	No.
Dissertation Abstracts	7 (1 duplicate subscription)
RIE	6 (2 duplicate subscriptions)
Bibliography of Agriculture	5 (1 duplicate subscription)
Business Periodicals Index	5 (3 duplicate subscriptions)
CIJE	5 (1 duplicate subscription)
Reader's Guide	5 (4 duplicate subscriptions)
Science Citation Index	5 (3 duplicate subscriptions)
Sociological Abstracts	5 (no duplicate subscriptions)
Books in Print	4 (1 duplicate subscription)
Psychological Abstracts	4 (all duplicate subscriptions)

drop in the social sciences during the time period. Another, which is not able to provide data for both years, indicates that the number fell from 499 in 1987–1988 to zero in 1989–1990. A total of seventy libraries report expenditures for 1989–1990; the mean amount is $18,534. The mean for the fifty-four libraries indicating 1984–1985 expenditures is $23,656.

While it is not possible to assign a direct causal link to the rise of CDs in libraries and changes in mediated online searching, there well may be a coincidental relationship. The working hypotheses regarding numbers of searches and expenditures on mediated searches are stated above. The null hypotheses are that there is no statistically significant difference ($p < .05$) between the number of searches in 1989–1990 and that in 1984–1985, and between amount expended in 1989–1990 and that in 1984–1985. In order to test these hypotheses, the *t*-test is employed. Since there is a population of libraries reporting comparable data for the two years in question, a paired *t*-test (that is, one which matches the responses for the two years for each library) presents a more accurate indication of comparison. Seventy-two libraries report data regarding the number of mediated searches conducted for both years. The computed *t* value ($df = 70$) is 8.79; therefore the null hypothesis is rejected at $p < .05$. (Actually, in this instance the hypothesis can be rejected at $p < .001$.) Only sixteen libraries report conducting more searches in 1989–1990 than in 1984–1985; one reports an identical number. The paired *t*-test can also be used to test the null hypothesis with regard to expenditures. Fifty-four libraries respond with data for both years. The computed *t* value ($df = 52$) is 2.52, so the null hypothesis is rejected once again at p.05. Of the fifty-four libraries reporting comparable data for both years, eighteen indicate that they spent more in 1989–1990 than in 1984–1985. If constant dollars were used (that is, if figures were not corrected for inflation), the difference in the time period would be even greater.

The remaining questions inquire about print sources canceled as a result of online access or CD-ROM purchase. A total of 107 libraries respond concerning the effect on print titles of availability of online databases. Thirty-four libraries indicate that in recent years they have canceled seventy-three subscriptions of fifty-four unique titles (many of the cancellations being of duplicate subscriptions). The cancellations due to online availability are quite diffuse. The title mentioned most frequently is *Chemical Abstracts*, with seven subscriptions canceled—six of those were either duplicate or incomplete subscriptions. *Psychological Abstracts* was the target of three cancellations, all of them

duplicate subscriptions. Three libraries also canceled *Exerpta Medica; none of these was a duplicate.*

More subscriptions (104) to slightly fewer unique titles (50) were canceled because of the availability of CD-ROM products. The ten most frequently mentioned titles are listed in table 2.

Some libraries also volunteer that five print sources were canceled because of the inclusion of some files in their online public access catalogs (OPACs). One library notes that it had canceled both print and CD subscriptions when databases were added to its OPAC. Several libraries note that titles are being considered for cancellation because of CD or online availability and one said that it has opted not to buy some print sources in the first place because of alternative media. One respondent states, "We have a standard policy of canceling print versions whenever the CD-ROM is added to the network. We have received no resistance. We are experiencing great pressure to acquire as many CD-ROMs as possible." A recent study of the relationship between print subscriptions and online availability at colleges and universities with fewer than 10,000 students was conducted by Wall, Haney, and Griffin.[9] They find that online availability is an influencing factor in libraries' decisions to retain or cancel print subscriptions.

SUMMARY

As noted, the aim of this study is to present some benchmark data on CD-ROMs in academic libraries so that future comparisons may be made. Toward that end, descriptive data are presented regarding numbers of products purchased or subscribed to, numbers of workstations available, expenditures on products, and specific titles held. The findings detail the responses of libraries to the survey sent them. It is evident from these responses that CDs have found a place in libraries. Responses to questions on both usage and expenditures indicate that libraries are committing resources to the products and that they are being used at a rate that may well render them a cost-effective means of providing information to the library's users. The number of different titles of products mentioned by respondents shows that libraries are employing the medium to provide information in a wide diversity of areas.

The results of this survey also display the decline of online searching activity in libraries in recent years. The drops in both number of searches and amount expended on the service are statistically significant. Further study of these phenomena may seek to determine how online access will be used in academic libraries in the future and which subject areas will be affected most. Charles and Clark present one strategy for the use of online databases—updating CD-ROM searches with online availability.[10] One outcome of such an investigation may be the formulation of a model that can be employed by libraries to predict future expenditures for online services, so that budgetary decisions may be simplified.

Additionally, some libraries are taking long looks at their holdings in other media, especially print, and choosing to make some cancellations. Given the reality of financial constraints faced by libraries, the need to make the best use of funding is evident. Future research will have to address the trade-offs when libraries opt for one storage and retrieval medium over another. Questions library staff must consider involve cost to the users, ancillary costs to the library (such as hardware and supplies), retrieval flexibility, and space. This study presents some data that individual libraries can use to assess the activities of their own operations and that libraries in general can employ in conducting longitudinal studies in the future. The breadth of this study should allow for these comparisons and should provide an indication of the current state of CD-ROMs in libraries.

REFERENCES AND NOTES

1. Kathy M. Jackson, Evelyn M. King, and Jean Kellough, "How to Organize an Extensive Laserdisk Installation: The Texas A&M Experience," *Online* 12 (Mar. 1988): 51–60; and Sandra L. Tucker, Vicki Anders, Katharine E. Clark, and William R. Kinyon, "How to Manage an Extensive Laserdisk Installation: The Texas A&M Experience," *Online* 12 (May 1988): 34–46.
2. Stephen P. Harter and Susan M. Jackson, "Optical Disc Systems in Libraries: Problems and Issues," *RQ* 27 (Summer 1988): 517–18.
3. Joseph A. Michalak, "Observations on the Use of CD-ROM in Academic Libraries," *Serials Librarian* 17, nos. 3/4 (1990): 63.
4. Beth Juhl and Anita Lowry, "The CD-ROM 'Revolution' at Columbia: Year One," *Serials Librarian* 17, nos. 3/4 (1990): 71–72.
5. Peggy Johnson, "Dollars and Sense," *Technicalities* 9 (Mar. 1989): 7.
6. Ann Bristow Beltran, "Funding Computer-Assisted Reference in Academic Research Libraries," *Journal of Academic Librarianship* 13 (Mar. 1987): 7.
7. Karen Sandlin Silverman, "CD-ROM in Libraries: Access, Trends and Challenges," *Serials Librarian* 17, nos. 3/4 (1990): 52.
8. The survey instrument is available from the authors. Anyone wishing to obtain a copy should contact John M. Budd at the School of Library & Informational Science, University of Missouri–Columbia, Columbia, Missouri 65211.
9. Celia Wall, Roger Haney, and John Griffin, "Hard Copy versus Online Services: Results of a Survey," *College & Research Libraries* 51(May 1990): 267–76.
10. Susan K. Charles and Katharine E. Clark, "Enhancing CD-ROM Searches with Online Updates: An Examination of End-User Needs, Strategies, and Problems," *College & Research Libraries* 51 (July 1990): 321–28.

Research Notes

Attribute Sampling: A Library Management Tool

Jack E. Kiger and Kenneth Wise

Attribute sampling is a tool that librarians may use to estimate characteristics of their collection, such as the portion of books needing repair, the accuracy of the circulation records, or the accuracy of cataloging activities. Because sampling always results in risk that the sample is not an accurate indicator of true conditions, one can establish the risk of an incorrect inference. This article describes the nature of attribute sampling and presents the process a librarian might use to make a defensible inference.

Librarians may need to estimate the maximum rate of occurrence of some specific quality or attribute for a particular function within their library. Making these estimates can be difficult since libraries tend to be rather large operations having some functions that are cumbersome to analyze. Making inferences about the number of books missing from the collection, or the accuracy of the circulation system, or the percentage of items in the collection that is not properly barcoded would be intimidating tasks indeed if the librarian had to review all items or records before drawing any conclusions.

Library management literature (Drott, 1969; Dougherty, et al., 1982; Simpson, 1988; and Powell, 1991) has discussed the use of attribute sampling to estimate attributes such as the average number of patrons served per day or the average age of patrons. These approaches involve the use of equations, which makes the process unnecessarily complex. Certified public accountants often employ the techniques discussed in this article to estimate the maximum occurrence rate of a phenomenon, such as the maximum portion of the books reflected in the records as being on the shelf that are not. Advantages of the technique are that by using a table to determine sample size and another table to evaluate results, one can draw measurably precise conclusions based on an examination of relatively few items. In the following discussion, we will describe the nature of attribute sampling and illustrate how the librarian may use attribute sampling techniques in managing library operations.

Jack E. Kiger is Warren L. Slagle Professor of Accounting, College of Business Administration, and Kenneth Wise is Business Manager of the University Libraries at the University of Tennessee, Knoxville, Tennessee 37996.

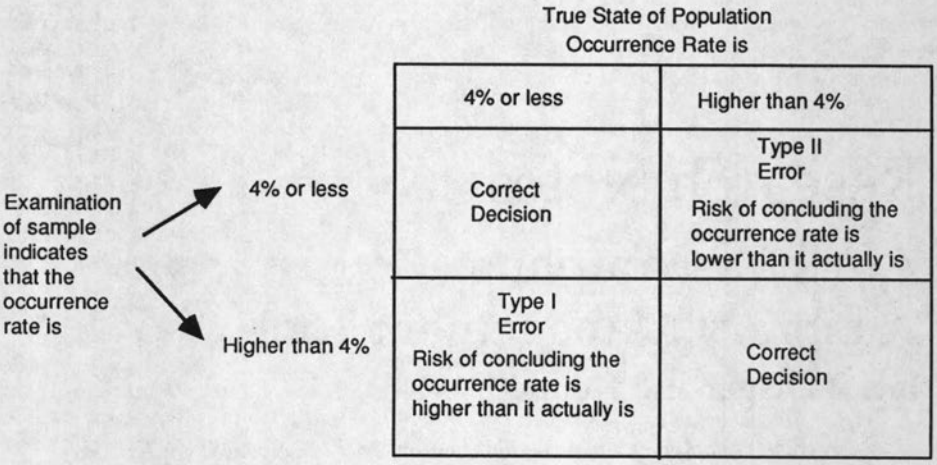


FIGURE 1
Sampling Risk in Attribute Testing

THE NATURE OF STATISTICAL SAMPLING

Statistical sampling involves applying procedures to fewer than all items composing a population. A population is all items about which one wishes to make an inference, such as all the books on reserve, all rare books, all books currently circulating, or all bound volumes. Sampling is based on the premise that a sample will be representative of the population. After examining the sample, one makes an inference about the population.

Attribute sampling, a statistical technique, estimates the rate or percentage of occurrence of a specific characteristic or attribute in a population. Attribute sampling is concerned with a rate of occurrence. For example, attribute sampling may be used to estimate the maximum percentage of books not on the shelf that the catalog record indicates are on the shelf. When using such sampling, one evaluates whether a characteristic or attribute is present with a yes or no answer.

Sampling Risk

When selecting a statistical sample from a population, the objective is to obtain a sample that has the same characteristics as the entire population. For example, if an examination of a sample indicates that 2 percent of the books that should have been on the shelf were not there, one would expect that 2 percent of all the books in the population would not be on the shelf. However, one must accept the risk that the conclusion based on examining a sample will be different from the conclusion if the entire population were examined. This risk is referred to as *sampling risk*. Sampling risk is the risk that the projected characteristics will be different from the true characteristics of the population because all items in the population were not examined. When one is unwilling to accept any sampling risk, one must examine every item in the population.

Considering the relationship between risk and reliability makes the nature of risk clearer. Reliability, a measure of the dependability of an estimate based on a sample, is the complement of risk (1 minus risk). One can specify a level of reliability and determine the number of items that must be examined to achieve it. The degree of reliability of an estimate based on a sample increases as the portion of the items in the population is examined increases. Examining a relatively small number of items can provide

a high degree of reliability beyond which additional testing will improve reliability only in very small increments. Also one can have complete confidence in an estimate by examining the whole population.

A librarian who examines a sample and concludes that the occurrence rate of a specific characteristic is 4 percent or less when the population's occurrence rate is 4 percent or less makes a correct decision (see figure 1). Similarly, when a librarian examines a sample containing a 4 percent or greater occurrence rate and the occurrence rate in the population is 4 percent or greater, the librarian makes a correct decision.

Attribute sampling, a statistical technique, estimates the rate or percentage of occurrence of a specific characteristic or attribute in a population.

However, when sampling, one may make either of two mistakes. One may conclude that the occurrence rate is higher than 4 percent when it is not. In such a situation, the occurrence rate is estimated to be higher than it actually is. Making such an error is generally referred to as a *Type I error* and the risk of making such an error is referred to as *Alpha risk.* Alternatively, one may examine a sample and conclude that the occurrence rate is 4 percent or less when it actually is not. This type of error is referred to as a *Type II error* and the risk of making such an error is referred to as a *Beta risk.* In such a situation, the librarian concludes the occurrence rate to be lower than it actually is.

When sampling results cause a librarian to conclude that the occurrence rate is higher than it actually is, the librarian may incur additional costs by assigning staff to check and correct all of the records. When a librarian concludes that the occurrence rate is lower than it is, the librarian accepts the occurrence rate as satisfactory when it is really not. Hence, the records continue to be in error.

Should a librarian conclude that the occurrence rate is less than it actually is, the librarian would assume that the records are correct. Hence, when sampling, librarians are concerned with the risk of concluding the occurrence rate is lower than it actually is. This risk (Beta) may be reduced by increasing the sample size. Sampling risk varies inversely with the sample size: the greater the sample size, the smaller the sampling risk. Increasing the sample size to include all items in the population would eliminate all sampling risk.

Nonsampling Risk

In addition to the sampling risk, librarians incur the nonsampling risk, which results from human error such as failure to recognize an occurrence when performing a procedure or use of an ineffective procedure. For example, an exhausted or inadequately trained person might misread a call number when examining a book. An example of using an ineffective procedure is comparing only the title of a book to the catalog record rather than comparing all of the details. Nonsampling risk does not result from failure to examine all items in the population. Nonsampling risk is not ordinarily quantified. Librarians may minimize nonsampling risk by providing adequate training and supervision to persons examining sample items.

Statistical versus Nonstatistical Sampling

Statistical sampling requires using random techniques for selecting a sample and using the laws of probability to evaluate results of the sampling process. Nonstatistical sampling refers to selecting a sample without using random selection techniques or making an inference from a sample without using the laws of probability. When using statistical sampling, a librarian can use probability theory to make statements or generalizations about a population and to measure the risk that the sample is not representative of the population (sampling risk). Statistical sampling also assists the librarian in setting an efficient sample size and in evaluating sample results.

Sampling is not always appropriate. For example, a librarian wishing to correct all of the errors in the circulation system may identify errors but would not detect all of them by sampling. The rare book librarian may choose not to verify every item in the listing while the newspaper librarian may verify no items.

MAKING A STATISTICAL INFERENCE

Statistical sampling provides a framework for making a statistical inference. Below, we will discuss the steps in making a statistical inference:

1. Determine the objective of the statistical inference.
2. Define the population and the sampling unit.
3. Determine the acceptable risk of concluding that the occurrence rate is lower than it actually is.
4. Set the tolerable occurrence rate.
5. Determine the expected population occurrence rate.
6. Using a statistical sample size table, determine the initial sample size.
7. Using random sampling techniques, identify the actual items to examine.
8. Examine the selected items and identify occurrences of deviations.
9. Make conclusions about the frequency of occurrences.

To illustrate these steps, we will assume that a librarian wants to estimate the portion of books missing from a specified range of the collection; for example, all books in the LC classification PR, generally the English literature collection. The collection consists of 15,000 items readily identifiable in the catalog record. The librarian is willing to accept a 5 percent risk of concluding that the occurrence rate is lower that it actually is and that the records are accurate enough if they contain a 4 percent error rate. The librarian expects that only .5 percent of the books are missing.

Determine the Objective of the Statistical Inference

Attribute sampling is used to estimate the rate of occurrence or percentage of items with a specific quality or attribute within a population. An attribute is a characteristic of an item being examined. When the characteristic is not present, a deviation exists. For example, a librarian may be concerned about the reliability of the catalog records of the English literature collection. On the basis of professional judgment, the librarian would like to be able to determine that 4 percent or fewer of the books which the catalog records show as being on the shelf are missing. Rather than determining the accuracy of every item in the catalog record the librarian establishes the hypothesis that the occurrence rate of the deviation is 4 percent or less. The attribute being examined is whether a book that should be on the shelf according to the catalog record is in fact on the shelf. When the librarian examines the shelf, the book is either there or it is not. When the librarian looks on the shelf for a book and it is not there, a deviation exists.

One must identify the population in such a way as to ascertain that all items in the population are subject to being included in the sample.

Define the Population and Sampling Unit

A population is all the items about which one wishes to make an inference. The population one examines is generally dictated by the objective of using attribute sampling. For example, if one is evaluating whether the catalog records include all English literature books actually on the shelf, the population is all of the English literature books on the shelf at a particular point in time. If one is evaluating the accuracy of the catalog records, the population is all the catalog records of English literature books at a particular point in time. A population consists of sampling units. A sampling unit is an individual item such as a book or an entry in a record of the population (such as the catalog record) that is examined.

One must identify the population in such a way as to ascertain that all items in the population are subject to being included in the sample. For example, if one wants to make an inference about the entire collection of English literature books, all books in the collection must be subject to selection, not just those currently on the shelves.

Population size has little impact on the sample size for populations of less than 5,000 items, and no effect on sample size for populations of 5,000 or more items.

Specify Acceptable Risk of Concluding that the Occurrence Rate Is Lower Than It Actually Is

When sampling, one must accept some risk that his or her conclusion about the population occurrence rate of a characteristic is incorrect. The risk of concluding that the occurrence rate is lower than it actually is refers to the probability of accepting an attribute as satisfactory because of the tolerable occurrence rate specified when the occurrence rate actually is higher. When specifying a 5 percent risk of concluding that the occurrence rate is lower than it actually is, one accepts a 5 percent chance of concluding that an occurrence rate is lower than the tolerable rate when it is not. Looking at it another way, one has a 95 percent reliability level or a 95 percent chance of being right.

Prior to selecting a sample and performing procedures to determine the presence or absence of an attribute, one must specify the acceptable risk of concluding that the occurrence rate is lower than it actually is. The higher the risk of concluding that the occurrence rate is lower than it actually is, the smaller the required sample size. This is logical, because the higher the risk, the smaller the likelihood that the sample will be representative of the population. In other words, the less evidence gathered, the higher the risk of concluding that the occurrence rate is lower than it actually is. As discussed below, the acceptable risk of concluding that the occurrence rate is lower than it actually is determines which sample size table to use.

Set the Tolerable Occurrence Rate

The tolerable occurrence rate is the maximum occurrence rate for a specific attribute that the librarian will permit. For example, consider a librarian's test of the catalog records for English literature books. When setting the tolerable occurrence rate at 4 percent, the librarian has decided that even if 4 percent of the English literature books included in the catalog records are not on the shelf, the assessment of the occurrence rate would not change.

Setting the tolerable occurrence rate involves judgment. Tolerable occurrence rates vary with the importance of a particular attribute. The more critical the attribute, the lower the tolerable occurrence rate should be.

Estimate the Expected Population Occurrence Rate

The expected population occurrence rate or the frequency of the attribute also affects the initial sample size. An estimate of the rate can be made from the previous year's occurrence rate, the occurrence rate in a preliminary random sample of the population being examined, or an estimate based on one's experience with occurrence rates in similar situations. Estimating the occurrence rate incorrectly may cause the initial sample size to be incorrect and require selecting an additional sample. Fortunately, an incorrect estimate does not increase the risk of concluding that the occurrence rate is lower than it actually is.

The smaller the expected occurrence rate in relation to the tolerable occurrence rate, the smaller the required sample size. In other words, when the maximum tolerable occurrence rate is 4 percent, and the estimate of the actual occurrence rate is .5 percent, the sample size will be smaller than if the estimate of the actual occurrence rate were 2 percent. The closer the expected population occurrence rate is to the tolerable occurrence rate, the larger the required sample size.

Determine the Initial Sample Size

After estimating the expected population occurrence rate, specifying a risk of

TABLE 1
DETERMINATION OF SAMPLE SIZE TABLE—10% RISK OF CONCLUDING THE OCCURRENCE RATE IS LOWER THAN IT ACTUALLY IS

Expected Percent Rate of Occurrence	Tolerable Rate: % Rate of Occurrence									
	1	2	3	4	5	6	7	8	9	10
0.25	400	200	140	100	80	70	60	50	50	40
0.50	800	200	140	100	80	70	60	50	50	40
1.0		400	180	100	80	70	60	50	50	40
1.5		*	320	180	120	90	60	50	50	40
2.0			600	200	140	90	80	50	50	40
2.5			*	360	160	120	80	70	60	40
3.0				800	260	160	100	90	60	60
3.5				*	400	200	140	100	80	70
4.0					900	300	200	100	90	70
4.5					*	550	220	160	120	80
5.0						*	320	160	120	80
5.5						*	600	280	160	120
6.0							*	380	200	160
6.5							*	600	260	180
7.0								*	400	200
7.5								*	800	280
8.0									*	460
8.5									*	800
9.0										*
9.5										*

* Sample size more than 1,000.

concluding the occurrence rate is lower than it actually is, and setting a tolerable occurrence rate, one may use a sample size table such as that in table 1, 2, or 3 to make an initial estimate of sample size. The sample size is called the initial sample size because the occurrence rate in the actual sample determines whether the sample size is large enough to reach the desired conclusion.

The specified risk of concluding the occurrence rate is lower than it actually is determines which table to use. The sample size tables are one-sided tables because they present an upper occurrence rate (not an upper and lower) for a given risk of concluding that the occurrence rate is lower than it actually is. One-sided tables are used because of concern with knowing the maximum, not the minimum occurrence rate.

The librarian is willing to accept a 5 percent risk of concluding that the occurrence rate is lower than it actually is, and is willing to assume that the catalog records are accurate enough if they contain a 4 percent error rate (tolerable occurrence rate), and expects the population occurrence rate to be .5 percent. To determine the initial sample size, follow these steps:

1. Locate the table that corresponds to the acceptable risk of concluding that the error rate is lower than it actually is.
2. Locate at the top of the table the tolerable occurrence rate.
3. Locate the expected occurrence rate at the left of the table.
4. Read the initial sample size from the intersection of the column (determined in 2 above) and row (determined in 3 above).

Using table 2, the initial sample size is 120. Table 4 shows the effect of the risk of concluding the occurrence rate is

TABLE 2
DETERMINATION OF SAMPLE SIZE TABLE—5% RISK OF CONCLUDING THE OCCURRENCE RATE IS LOWER THAN IT ACTUALLY IS

Expected Percent Rate of Occurrence	Tolerable Rate: % Rate of Occurrence									
	1	2	3	4	5	6	7	8	9	10
0.25	650	240	160	120	100	80	70	60	60	50
0.50	*	320	160	120	100	80	70	60	60	50
1.0		600	260	160	100	80	70	60	60	50
1.5		*	400	200	160	120	90	60	60	50
2.0			900	300	200	140	90	80	70	50
2.5			*	550	240	160	120	80	70	70
3.0				*	400	200	160	100	90	80
3.5				*	650	280	200	140	100	80
4.0					*	500	240	180	100	90
4.5					*	800	360	200	160	120
5.0						*	500	240	160	120
5.5						*	900	360	200	160
6.0							*	550	280	180
6.5							*	1000	400	240
7.0								*	600	300
7.5								*	*	460
8.0									*	650
8.5									*	*
9.0										*
9.5										*

* Sample size more than 1,000.

lower than it actually is, tolerable occurrence rate, and expected population occurrence rate on the initial sample size. The relationship between sample size and these factors can be summarized in table 5.

Select the Sample

After determining the initial sample size, select a random sample from the population. A random sample is a sample in which every sampling unit in the population has an equal chance of being included in the sample. For the English literature collection example, a librarian would select 120 entries in the catalog record. While books including random number tables are available, using computer software to generate a listing of random numbers is much more efficient. Both Lotus and Excel have a feature for generating random numbers. Also, most computer programmers can easily incorporate random number generators into programs they routinely run to select a random sample.

Examine the Items in the Sample

Next, the librarian performs procedures to determine whether deviations occur. The procedures are the same whether one uses statistical sampling or examines all items in the population. As stated above, a deviation exists for any book that the record indicates is on the shelf if the book is not on the shelf. Assume that only one English literature book was not found on the shelf.

Evaluate the Sample Results

The librarian may calculate the occurrence rate of deviations in the sample and use it to estimate the population's upper occurrence rate. The sample occurrence rate is computed by dividing the occurrence rate for each attribute by the sample size. This rate is the best esti-

TABLE 3
DETERMINATION OF SAMPLE SIZE TABLE—1% RISK OF CONCLUDING THE OCCURRENCE RATE IS LOWER THAN IT ACTUALLY IS

Expected Percent Rate of Occurrence	Tolerable Rate: % Rate of Occurrence									
	1	2	3	4	5	6	7	8	9	10
0.25	*	340	240	180	140	120	100	90	80	70
0.50	*	500	280	180	140	120	100	90	80	70
1.0		*	400	260	180	140	100	90	80	70
1.5		*	800	360	200	180	120	120	100	90
2.0			*	500	300	200	140	140	100	90
2.5			*	1000	400	240	200	160	120	100
3.0				*	700	360	260	160	160	100
3.5				*	*	550	340	200	160	140
4.0					*	800	400	280	200	160
4.5					*	*	600	380	220	200
5.0						*	900	460	280	200
5.5						*	*	650	380	280
6.0							*	1000	500	300
6.5							*	*	800	400
7.0								*	*	600
7.5									*	800
8.0									*	*
8.5									*	*
9.0										*
9.5										*

* Sample size more than 1,000.

TABLE 4
EFFECT OF RISK, TOLERABLE OCCURRENCE RATE, AND EXPECTED OCCURRENCE RATE ON INITIAL SAMPLE SIZE ON

Risk of Concluding the Occurrence Rate Is Lower Than It Actually Is	Tolerable Occurrence Rate	Expected Population Occurrence Rate	Initial Sample Size
5%	6%	1.0%	78
5	6	2.0	129
5	5	2.0	181
10	5	2.0	132

mate of the occurrence rate for the population. A statistical table similar to the ones in tables 6, 7, or 8 may be used to estimate the population's upper occurrence rate at the level of risk specified earlier. The initial sample size was determined to be 120. When examining the sample, one occurrence was found. The librarian would estimate that approximately 1 percent (computed by dividing 1 by 120) of English literature books are missing. To estimate the population's

TABLE 5
RELATIONSHIP BETWEEN OCCURRENCE RATE AND SAMPLE SIZE

Change In	Impact on Sample Size
Expected population occurrence rate	Direct
Tolerable occurrence rate	Inverse
Risk of concluding the occurrence rate is lower than it actually is	Inverse

TABLE 6
TABLE FOR EVALUATING SAMPLE RESULTS—10% RISK OF CONCLUDING OCCURRENCE RATE IS LOWER THAN IT ACTUALLY IS

Sample Size	Number of Observed Occurrences Achieved Upper Precision Limit: % Rate of Occurrence																			
	1	2	3	4	5	6	7	8	9	10	12	14	16	18	20	25	30	35	40	45
10																0		1		2
20											0				1	2		3	4	5
30								0				1		2		4	5	6	8	9
40						0				1		2	3		4	6	7	9	11	13
50					0			1			2	3	4	5		8	10	12	15	17
60				0			1		2		3	4	5	6	7	10	13	15	18	21
70				0		1		2		3	4	5	6	8	9	12	15	18	22	25
80			0		1		2		3	4	5	6	8	9	10	14	18	22	25	29
90			0		1	2		3	4		6	7	9	11	12	16	20	25	29	33
100			0	1		2	3	4		5	7	9	10	12	14	19	23	28	33	38
120		0		1	2	3	4	5	6	7	9	11	13	15	17	23	29	34	40	46
140		0	1	2	3	4	5	6	7	9	11	13	16	18	21	27	34	41	48	54
160		0	1	2	4	5	6	8	9	10	13	16	19	22	25	32	40	47	55	63
180		0	2	3	4	6	7	9	10	12	15	18	22	25	28	37	45	54	63	71
200	0	1	2	4	5	7	8	10	12	14	17	21	24	28	32	41	51	60	70	80
220		1	2	4	6	8	10	12	13	15	19	23	27	31	35	46	56	67	78	89
240	0	1	3	5	7	9	11	13	15	17	21	26	30	35	39	50	62	74	85	97
260	0	1	3	5	8	10	12	14	17	19	24	28	33	38	43	55	68	80	93	106
280	0	2	4	6	8	11	13	16	18	21	26	31	36	41	46	60	73	87	101	114
300	0	2	4	7	9	12	14	17	20	22	28	33	39	45	50	64	79	93	108	123
320	0	2	5	7	10	13	16	18	21	24	30	36	42	48	54	69	85	100	116	132
340	0	3	5	8	11	14	17	20	23	26	32	38	45	51	58	74	90	107	123	140
360	0	3	6	9	12	15	18	21	25	28	34	41	48	55	61	79	96	113	131	149
380	0	3	6	9	13	16	19	23	26	30	37	44	51	58	65	83	102	120	139	158
400	1	4	7	10	14	17	21	24	28	31	39	46	54	61	69	88	107	127	146	166
420	1	4	7	11	14	18	22	26	29	33	41	49	57	65	73	93	113	134	154	175
460	1	4	8	12	16	20	24	28	33	37	45	54	63	71	80	102	124	147	170	192
500	1	5	9	13	18	22	27	31	36	40	50	59	69	78	88	112	136	160	185	210
550	2	6	10	15	20	25	30	35	40	45	55	66	76	87	97	124	150	177	204	232
600	2	7	12	17	22	28	33	39	44	50	61	72	84	95	107	135	165	194	224	253
650	2	8	13	19	24	30	36	42	48	54	66	79	91	104	116	147	179	211	243	275
700	3	8	14	20	27	33	39	46	52	59	72	85	99	112	126	159	194	228	262	297
800	4	10	17	24	31	38	46	53	61	68	83	99	114	129	145	183	222	262	301	341
900	4	12	20	28	36	44	52	61	69	78	95	112	129	146	164	207	251	296	340	385
1000	5	13	22	31	40	49	59	68	77	87	106	125	144	164	183	232	280	330	379	429

TABLE 7
TABLE FOR EVALUATING SAMPLE RESULTS—5% RISK OF CONCLUDING OCCURRENCE RATE IS LOWER THAN IT ACTUALLY IS

Sample Size	Number of Observed Occurrences Achieved Upper Precision Limit: % Rate of Occurrence																			
	1	2	3	4	5	6	7	8	9	10	12	14	16	18	20	25	30	35	40	45
10																	0		1	
20												0				1	2	3		4
30										0			1		2	3	4	5	7	8
40								0			1		2		3	5	6	8	10	12
50						0				1		2	3	4	5	7	9	11	13	16
60					0			1			2	3	4	5	6	9	11	14	17	20
70					0		1		2		3	4	5	7	8	11	14	17	20	24
80				0		1		2		3	4	5	7	8	9	13	16	20	24	28
90				0		1	2		3	4	5	6	8	9	11	15	19	23	27	32
100			0		1		2	3	4		6	8	9	11	13	17	22	26	31	36
120			0	1		2	3	4	5	6	8	10	12	14	16	21	27	33	38	44
140			0	1	2	3	4	5	6	7	10	12	14	17	19	26	32	39	46	52
160		0	1	2	3	4	5	6	8	9	12	14	17	20	23	30	38	45	53	61
180		0	1	2	3	5	6	8	9	11	14	17	20	23	26	35	43	52	60	69
200		0	1	3	4	6	7	9	11	12	16	19	23	26	30	39	48	58	68	77
220		0	2	3	5	7	8	10	12	14	18	22	25	29	33	44	54	64	75	86
240		1	2	4	6	8	10	12	14	16	20	24	28	33	37	48	59	71	83	94
260		1	3	4	7	9	11	13	15	17	22	26	31	36	41	53	65	77	90	103
280		1	3	5	7	10	12	14	17	19	24	29	34	39	44	57	71	84	98	111
300	0	1	3	6	8	11	13	16	18	21	26	31	37	42	48	62	76	91	105	120
320	0	2	4	6	9	11	14	17	20	22	28	34	40	45	51	66	82	97	113	128
340	0	2	4	7	10	12	15	18	21	24	30	36	42	49	55	71	87	104	120	137
360	0	2	5	8	10	13	17	20	23	26	32	39	45	52	59	76	93	110	128	146
380	0	2	5	8	11	14	18	21	24	28	34	41	48	55	62	80	98	117	135	154
400	0	3	6	9	12	15	19	22	26	29	37	44	51	59	66	85	104	123	143	163
420	0	3	6	9	13	16	20	24	27	31	39	46	54	62	70	90	110	130	151	171
460	0	4	7	11	15	18	22	26	31	35	43	51	60	68	77	99	121	143	166	188
500	1	4	8	12	16	21	25	29	34	38	47	56	66	75	84	108	132	157	181	197
550	1	5	9	14	18	23	28	33	38	43	53	63	73	83	94	120	146	173	200	227
600	1	6	10	15	20	26	31	36	42	47	58	69	80	92	103	132	161	190	219	249
650	2	6	12	17	23	28	34	40	46	52	64	76	88	100	112	143	175	207	239	271
700	2	7	13	19	25	31	37	43	50	56	69	82	95	108	122	155	189	223	258	292
800	3	9	15	22	29	36	43	51	58	65	80	95	110	125	141	179	218	257	296	336
900	4	10	18	26	34	42	50	58	66	74	91	108	125	142	159	203	247	291	335	379
1000	4	12	20	29	38	47	56	65	74	84	102	121	140	159	178	227	275	324	374	423

TABLE 8
TABLE FOR EVALUATING SAMPLE RESULTS—1% RISK OF CONCLUDING OCCURRENCE RATE IS LOWER THAN IT ACTUALLY IS

Sample Size	Number of Observed Occurrences Achieved Upper Precision Limit: % Rate of Occurrence																			
	1	2	3	4	5	6	7	8	9	10	12	14	16	18	20	25	30	35	40	45
10																			0	
20																0	1		2	3
30													0			1	3	4	5	6
40											0		1		2	3	5	7	8	10
50									0			1	2		3	5	7	9	11	13
60								0			1	2	3		4	7	9	12	14	17
70							0			1	2	3	4	5	6	9	11	14	18	21
80						0			1		2	4	5	6	7	10	14	17	21	25
90					0			1		2	3	5	6	7	9	12	16	20	24	29
100					0		1		2	3	4	6	7	9	10	14	19	23	28	33
120				0		1	2		3	4	6	8	9	11	13	18	24	29	35	40
140				0	1	2	3		4	5	7	10	12	14	16	22	29	35	42	48
160			0		1	2	3	5	6	7	9	12	14	17	20	27	34	41	49	56
180			0	1	2	3	4	6	7	8	11	14	17	20	23	31	39	47	56	65
200			0	1	3	4	5	7	8	10	13	16	19	23	26	35	44	54	63	73
220			0	2	3	5	6	8	10	11	15	18	22	26	30	39	50	60	70	81
240		0	1	2	4	6	7	9	11	13	17	21	25	29	33	44	55	66	78	89
260		0	1	3	5	6	8	10	12	14	19	23	27	32	36	48	60	72	85	97
280		0	2	3	4	7	9	12	14	16	21	25	30	35	40	53	65	79	92	106
300		0	2	4	6	8	10	13	15	18	23	28	33	38	43	57	71	85	99	114
320		0	2	4	7	9	11	14	17	19	24	30	35	41	47	61	76	91	107	122
340		1	3	5	7	10	13	15	18	21	26	32	38	44	50	66	82	98	114	131
360		1	3	6	8	11	14	16	19	22	28	35	41	47	54	70	87	104	122	139
380		1	3	6	9	12	15	18	21	24	30	37	44	50	57	75	93	111	129	148
400		1	4	7	10	13	16	19	22	26	32	39	46	54	61	79	98	117	136	156
420		2	4	7	10	14	17	20	24	27	35	42	49	57	64	84	103	124	144	164
460	0	2	5	8	12	15	19	23	27	31	39	47	55	63	72	93	114	136	159	181
500	0	3	6	10	13	17	21	26	30	34	43	52	60	70	79	102	125	149	174	198
550	0	3	7	11	15	20	24	29	34	38	48	58	68	78	88	113	139	166	192	219
600	0	4	8	13	17	22	27	32	37	43	53	64	78	86	97	125	153	182	211	241
650	0	4	9	14	19	25	30	36	41	47	58	70	82	94	106	136	167	198	230	262
700	1	5	10	16	21	27	33	39	45	51	64	76	89	102	115	148	181	215	249	283
800	1	7	13	19	25	32	39	46	53	60	74	89	103	118	133	171	209	248	287	326
900	2	8	15	22	29	37	45	53	61	69	85	101	118	135	152	194	237	281	325	369
1000	2	9	17	25	34	42	51	60	69	78	96	114	133	151	170	218	266	314	363	412

TABLE 9
EXAMPLES SHOWING EFFECT ON COMPUTED UPPER OCCURRENCE RATE OF CHANGING RISK, SAMPLE SIZE, AND NUMBER OF DEVIATIONS FOUND

Case	Risk of Concluding the Occurrence Rate Is Lower Than It Actually Is	Sample Size	No. of Deviations	Computed Upper Occurrence Rate
1	5%	50	1	9.1%
2	5	100	2	6.2
3	5	150	3	5.1
4	5	200	4	4.5
5	10	100	2	5.2
6	10	100	3	6.6

upper occurrence rate (called the *computed upper occurrence rate*), these steps should be followed:

1. Locate the table that corresponds to the risk of concluding that the occurrence rate is lower than it actually is that was specified earlier.
2. Locate the actual sample size at the left of the table.
3. Look across the row (identified in step 2) to find the actual number of occurrences found when examining the sample
4. Look to the top of that column (identified in step 3) to read the computed upper occurrence rate.

Librarians, too, may find attribute sampling useful to make inferences about characteristics such as the portion of books misclassified, the error rate in the catalog record, or the portion of books missing.

Using table 7, the librarian would conclude that the maximum percent of books missing (computed upper occurrence rate) is 4 percent. Comparing the computed upper occurrence rate to the maximum tolerable rate indicates that the records meet the librarian's criteria. If the computed upper occurrence rate is less than or equal to the tolerable occurrence rate, the librarian may statistically conclude that the records are satisfactory. Earlier, the librarian specified a tolerable occurrence rate of 4 percent. Hence, the librarian may conclude that the records are okay unless the qualitative aspects of the occurrence should be considered. In contrast, had the librarian found two occurrences, the librarian should have concluded that the maximum occurrence rate was 6 percent, which exceeds the tolerable rate. Two occurrences yield a significantly higher occurrence rate than the librarian originally expected. Hence, because the actual occurrence rate is much greater than anticipated, a librarian may choose to expand the sample. We will discuss qualitative aspects of occurrences later.

Table 9 presents a series of cases which show the effect on the computed upper deviation rate of changing the number of occurrences found and risk.

Consider the Qualitative Aspects of Deviations

Before drawing a conclusion about the results of the sample, one should consider the qualitative characteristics of any occurrence found. Sometimes deviations in the sample may signal that unexamined population items include many occurrences or deviations. For example, deviations may occur because an employee was untrained or an employee's personal problems have resulted in less than quality performance.

CONCLUSION

Attribute sampling is a technique widely used by CPAs when auditing to make inferences about a population they

want to know about but cannot afford the time or cost to examine all items in the population. Librarians, too, may find attribute sampling useful to make inferences about characteristics such as the portion of books misclassified, the error rate in the catalog record, or the portion of books missing. Attribute sampling techniques provide a basis for making defensible statements about an attribute of a population. This article describes techniques auditors utilize that librarians may apply when sampling to estimate occurrence rates. These techniques also enable librarians to evaluate the risk of making an incorrect estimate. While that risk always exists, the tables used for determining initial sample size and evaluating results enable the sampler to control the risk of concluding that the occurrence rate is lower than it actually is.

REFERENCES

1. D. M. Guy and D. R. Carmichael. *Audit Sampling: An Introduction to Statistical Sampling in Auditing*. New York: Wiley, 1986.
2. Carl M. Drott. "Random Sampling: A Tool for Library Research." *College & Research Libraries* 30 (March 1969) 119–25.
3. Richard M. Dougherty and Fred J. Heinritz with the assistance of Neal K. Kaske. *Scientific Management of Library Operations*. Metuchen, N.J. and London: Scarecrow, 1982.
4. Ronald R. Powell. *Basic Research Methods for Librarians*, 2d ed. Norwood, N.J.: Ablex, 1991.
5. D. M. Roberts. *Statistical Auditing*. New York: American Institute of Certified Public Accountants, 1978.
6. I. S. Simpson. *Basic Statistics for Librarians*, 3d ed. London: Library Association, 1988.

Letter

To the Editor:

I read with interest Bonnie Horenstein's "Job Satisfaction of Academic Librarians: An Examination of the Relationships between Satisfaction, Faculty Status, and Participation" (*College & Research Libraries* 54 [May 1993].)

I have several methodological concerns about her study, however. The terms *faculty status* and *faculty rank* are too imprecise, convey multiple meanings, and reduce the validity of results of the study. For example, the questionnaire asks librarians to respond yes or no about having faculty status. This is a complex question and possibly there are multiple answers. For example, librarians of the University of California are academic appointees and do not have senate faculty status. And UC librarians have academic rank and career status, not faculty rank or tenure. So, if UC librarians had been sampled, they might have given diverse responses according to their interpretation of faculty status. In addition, Horenstein's questionnaire may have unintentionally included a self-fulfilling prophecy: only full-time librarians were sampled.

There is also a potential gender and ethnic bias as some important part-time librarians were excluded who may have been women or men with a family or other valuable duties. Also, several significant, developing areas of academic specialization were not listed in the service area of the questionnaire: bibliographic instruction; computer-assisted research; collection development; and research instruction. In addition, the author's survey seemed to include only currently employed librarians; it did not include librarians unemployed because of layoffs or hiring freezes. Clearly, regional and state economies may impact professional satisfaction.

In addition, the issue of political correctness is important. During academic downsizing and job reductions, some librarians would be politically correct to express high job satisfaction on an anonymous questionnaire because of concern that review initiators may learn of their professional dissatisfaction. Finally, academic librarians may have perceived differences between growing academic goals and current professional opportunities and had difficulty in communicating those concerns in terms of academic status and satisfaction. In essence, these significant issues of academic status and satisfaction require further in-depth study and analysis of the many factors influencing research librarians' attitudes and responses to surveys.

SALLY WILLSON WEIMER
Library, University of California at Santa Barbara

Book Reviews

Harris, Michael A., and Stan A. Hannah. *Into the Future: The Foundations of Library and Information Services in the Post-Industrial Era.* Norwood, N.J.: Ablex, 1993. 182p. $39.50 cloth, $19.95 paper (ISBN 1-56750-01503).

Treatises on the social environment of information often demonstrate the parochialism of the library literature. This new book is a welcome exception. It is both synthesis and commentary, intended to provide a background against which students and practitioners can make intelligent decisions about "the future of library and information service in these changing times." To remedy the "impoverished and incestuous nature of the literature of library and information science," the authors deftly summarize relevant theory from sociology, political economy, economics, and critical theory. The result is an exhilarating series of new perspectives and insights into the meaning of the information age, national information policy, professional identity, and workplace issues.

The book is structured around Daniel Bell's seminal concept of the post-industrial society, originally conceived in the early 1960s. Bell saw information as the totalizing principle that would define the society of the future, transforming a goods-producing into a service economy. The codification of theoretical knowledge and its application to problem solving within large and complex systems would be carried out by a new breed of information technologists, the knowledge elite. As Harris and Hannah point out, Bell's elitist, technocratic vision was characteristic of its time. Later critics have found flaws in Bell's vision, including the privileging of technology over other aspects of the social environment, leading to extremes of technophobia and technophilia. But, as Harris and Hannah also point out, "something very real is happening to contemporary society as a result of the emergence of information technology," yet "we remain uncertain as to what it is."

F. W. Lancaster, foremost advocate of the paperless library, is introduced as Bell's counterpart within the library profession. Lancaster foresaw the transformation of librarians into information entrepreneurs. His ideas launched continuing disputes over the fate of the book, the commodification of information, and the passive versus active role of librarians. Somewhat later, the golden age of state-sponsored library funding came to an end (an inevitable swing of the policy pendulum) and the Reagan administration began promoting privatization. Harris and Hannah illuminate issues surrounding state policy on information by tracing the historical dialectic between the accumulation (economic growth) and legitimation (social justice) functions of government.

Surveying the literature on the sociology of professions, the book casts doubt on any easy assumptions about the role of librarians in a post-industrial society. Nor is the impact of computerization on workers in general at all clear. Does automation lead to labor segmentation, a widening gap between knowledge workers and the unskilled? Or does it create more democratic, nonhierarchical organizations? Research on these matters has led to inconclusive results. As Harris and Hannah explore these questions, a picture begins to emerge of a library profession that is having difficulty coming to terms with political and economic change.

Marxist, feminist, and deconstructive points of view (seldom invoked in li-

brary literature) contribute some refreshing twists. For example, the belief that the traditional library was apolitical is exposed as an illusion. Similarly, concepts such as *democracy, freedom, equality,* and *neutrality* are shown to be contested concepts rather than timeless truths—a point made through an amusing comparison of the hacker's ethic of free access to all information and the only slightly less sweeping claims of the American Library Association. Apropos of a discussion of gender and librarianship (women do not fare well in the information age), the authors cite a study that "documents the way that men have always defined women's ideas as 'unoriginal,' thus legitimizing the exclusion of women from the upper ranks of the class system of the intellect."

The book concludes with a prolegomenon "to Library and Information Services in the Post-Industrial Era," in which the authors offer their own suggestions. This is the most disappointing part of an otherwise excellent book. Rather than actually taking positions, Harris and Hannah merely continue to set the stage for the formation of positions. They remind librarians that capitalism is dynamic by nature, and that change is inevitable. They advise us to acknowledge that the paradigm of library services "for the public good" is in eclipse—advice that may have already been superseded by the "politics of meaning" of the 1990s. Their call for a "commitment to arguing well" and a "struggle to establish a consensus" postpones commitment to actual choices. We will have to make those choices ourselves, of course, but at least we have been given a new way of thinking about them.—*Jean Alexander, Northwestern University, Evanston, Illinois.*

Towner, Lawrence W. *Past Imperfect: Essays on History, Libraries, and the Humanities.* Ed. by Robert W. Karrow, Jr., and Alfred F. Young. Chicago: University of Chicago Press, 1993. 298p. alk. paper, $25 (ISBN 0-226-81042-9).

Lawrence "Bill" Towner was for twenty-four years the director of the Newberry Library, one of the nation's most prestigious independent research libraries. This collection of Towner's writings, some previously unpublished, includes articles, essays, and speeches given on a variety of occasions. Published to mark his seventieth birthday, they are meant to define "the man and his vision"—to give us something of the flavor of the individual and to document his achievements as a historian, librarian, and spokesman for the humanities.

This volume is likely to be of greatest interest to librarians for an uncommon view of a visionary leader's personality and the library he shaped. The public Towner emerges as a man of great erudition, charm, coherence of vision, definite purpose, and adaptability, and he appears as someone capable of doing a great many different things—exemplary historical research, planning, administering, testifying before committees, cultivating mentors and donors—and using the appropriate rhetorical strategies for each occasion.

Towner's career as a historian was perhaps too brief to be truly distinguished, but his experience as a researcher had a distinct influence on some of the projects he undertook and promoted as a librarian. His interest in primary documents was reflected later when, as a librarian, he sponsored definitive editions of major American political figures and the microfilming of large bodies of documents. His convictions as a liberal historian of the progressive school and his interest in social contexts were evident in his own research, which focused on the behavior of marginal groups in colonial America—slaves, indentured servants, apprentices, and criminals. This interest in "democratizing" research is also apparent in his vigorous attempts to broaden access to the Newberry's beyond-the-usual clientele of university-affiliated scholars.

Towner's role as an articulate and forceful spokesman for the humanities also sheds an interesting light on his career as a librarian. This role is documented chiefly by his support of the National Endowment for the Humani-

ties and in the development of its funding priorities. Towner's championship of the NEH enabled libraries such as the Newberry to have access to public funding for the first time.

Towner may have been a very good scholar but he also turned out to be an exceptional administrator. Perhaps the most interesting article in this collection is a 1971 planning report internal to the Newberry entitled "A Plan for the Newberry Library," in which he described his vision of the Newberry's role. Towner viewed the library as one of "several varieties of educational institutions—museums, colleges, universities, academies, institutes, and independent libraries—all sharing a common objective. That objective is the enlargement of mankind's knowledge and the sharing of that knowledge with as large an audience as is practical for the kind of institution it is." For Towner, the library was an educational institution among others, not a mass of materials passively awaiting the attention of scholars. He promoted the planned use of the Newberry by introducing the Newberry Library Seminar in the Humanities. Ultimately, by making the library the site of the Northwestern-Newberry editions of the writings of Herman Melville and the *Atlas of American History*, and by creating the Center for the History of Cartography, he insured that the "uncommon collection of collections" at the Newberry would be utilized by specialists, and he brought to the library a community of scholars, some for short residences, others for permanent stays.

His plans as outlined in 1971 were grand—no less than creating an Institute for Advanced Study in History and the Humanities. Though the institute did not come to be, the Newberry added other "centers," such as the Center for the History of the American Indian, the Center for Family and Community History Center, and the Center for Renaissance Studies. He developed an active publication program, found grants to bring in scholars, and broadened access to the collection. The Newberry instituted one of the first in-house preservation laboratories, in which many librarians received their training. The library's collection also grew through judicious sales and purchases, a complex process described in a fascinating essay, "Every Silver Lining Has a Cloud: The Recent Shaping of the Newberry Library's Collections."

How did Towner manage to pay for all this? The editors diplomatically removed from the 1971 planning document Towner's list of potential funding sources, so we are left to guess about where the money came from. In the early days, it seems to have come from wealthy donors. Foundations also supported the Newberry's projects. Where sources of funding did not exist, Towner helped create them. He was instrumental in the creation of the NEH, which later was a source of funding for many of the Newberry's projects. Perhaps to his own surprise, Bill Towner turned out to be as much of an entrepreneur as a historian.

The most recent essay in the collection dates from 1983, and, in a way, the library world Towner describes seems old-fashioned and remote. Though preservation and security problems preoccupied Towner, he never mentions automation and its attendant benefits and problems. His essays on the Newberry, however, are well worth reading, not so much for solutions to concrete problems as for the alternative vision of the library which they offer and for the verve and initiative below the surface of the controlled prose and the formulaic structure of some of the pieces.—*Eva Sartori, University of Nebraska-Lincoln, Lincoln.*

Teaching Bibliographic Skills in History: A Sourcebook for Historians and Librarians. Ed. by Charles A. D'Aniello. Westport, Conn.: Greenwood, 1993. 385p. $65 (ISBN 0-313-25266-1).

The animating principle behind this work is to gather together material for the building of a bibliographic instruction course in history, but it is pitched to too many audiences and is written on too many different levels to be effective. It is also intended to bring together in one

book archivists, librarians, and historians in order to share their views and expertise on the art and science of doing historical research in libraries and archives. One wonders why this kind of book is necessary: librarians putting together such a course have at their fingertips more detailed sources that include all of the bibliographical material recapitulated here, and historians would not need the two introductory essays nor most of the library apparatus, such as the illustrations of catalog cards that adorn the volume.

The work begins with an essay by Georg Iggers that seems to be intended for beginning undergraduates, and is followed by Harry Ritter's essay on interdisciplinary history, much more detailed and demanding, which looks like something for advanced undergraduates or a first year graduate seminar. Jane A. Rosenberg's part of the essay on "Finding and Using Historical Materials" is an excellent summary of the inadequate (fruitless?) nature of research on the ways that historians use libraries, and concludes that "the historian's predilection for working alone and doing intermittent bibliographical or reference work has much to recommend it." The second half of the same essay seems unconnected to the first part: historian Robert P. Swierenga muses about how he would design a bibliographic instruction course. This section of the work ends with a long chapter by the editor which looks more or less like a syllabus/lesson plan for his own bibliographic instruction course. If this sounds a bit like a hodgepodge, it is. Instead of this scattershot approach, the field of bibliographic instruction might have been better served by a real exchange of ideas. What we have here are people from two professions talking past one another.

The second third of the volume is devoted to an uneven treatment of various reference and research topics, not all of which are particularly relevant to historical research. For example, there is a long detour into most of the fields of the social sciences by Raymond G. McInnis, which, useful in itself, is not devoted to either research in the history of these fields or the use of these fields when doing historical research. It is just there, with a curious disclaimer, printed as an orphan footnote, that one should read the chapter, "keep[ing] Harry Ritter's discussion of interdisciplinary historical research in mind." Bur Ritter's essay near the front of the work speaks directly to interdisciplinary history, not to the general existence of the social sciences.

The sections on using indexes and catalogs seem to suffer from the problems alluded to at the beginning of this review: the information included is much too elementary to be of use to librarians teaching the course, and written at the wrong level to interest historians. Perhaps this portion of the work is intended to be given to students to read, although that is not clear, like much about this diffuse sourcebook.

The final section of this sourcebook is devoted to a long annotated bibliography that brings together some of the materials cited in the rest of the work. Some of the entries in the bibliography are reprinted from a 1984 article in The History Teacher written by the editor, who has also reprinted here other materials that he had previously published. Although reprinting old material is not necessarily a problem in itself, it is indicative in this case of the lack of coherence and focus that characterizes the book as a whole.—*Elliott Shore, Institute for Advanced Study, Princeton, New Jersey.*

BRIEF NOTICES

Intertek. Ed. and pub. by Steve Steinberg, San Carlos, CA, 94070, 1990– . Semiannual, $8/year (ISSN 1066-2472).

This is the most substantive of the "cyberzines" spawned by the computer counterculture. The two most recent issues are organized around special themes of particular interest to librarians: "Virtual Communities" and "Economic, Social and Technical Aspects of Information." The first has an extended debate on the USENET paradigm of computer communication as well as an essay on the

social organization of the computer underground. The most recent issue features a critique of the notion of the "information age"; an essay on the incompatibility between capitalism and information; and a number of other pieces exploring the implications of the ownership of knowledge in an electronic environment. The journal's layout and graphics attempt to suggest the radically "de-centered" and improvisory nature of cyberspace. Academic librarians, accustomed to a more mundane treatment of technology, may be tempted to dismiss writing as "unruly" as that found in *Intertek*. This would be a mistake: cyberzines are constructing a serious discourse on the future of information. Librarians clearly have a place in this conversation. (*B.W.*)

Tarrow, Sidney. *Rebirth or Stagnation? European Studies after 1989.* New York: Social Science Research Council, June 1993. 43 p. Available gratis from the Social Science Research Council, 605 Third Ave., New York, NY 10158.

This report discusses the impact of various institutional and programmatic responses to recent changes in Europe on European studies in the United States, precipitated by the collapse of communism, German unification, and the implementation of the Single European Act. Sidney Tarrow conducted the study for the Social Science Research Council (SSRC), interviewing 120 Europeanists at twelve academic sites. Tarrow reviews the major challenges facing American social scientists studying Europe; identifies research questions arising from transformations in Europe; presents the educational and organizational challenges ahead; and offers a series of recommendations to ensure the vitality of European studies. Despite increased organizational support for European studies in the United States, overall funding has declined, and the report calls upon the SSRC to help formulate a "common strategy for shaping European studies." One hopes this future consultation will extend to research librarians, who have toiled alongside their academic counterparts to cultivate European studies. The report totally ignores trends in library collections and expenditures for European materials, which should form an integral part of any national research plan. (*M.L.B.*)

Caplan, Paula J. *Lifting a Ton of Feathers: A Woman's Guide to Surviving in the Academic World.* Toronto: Univ. of Toronto Pr., 1993. 273p. $45 (ISBN 0-8020-2903-5).

Intended for women who are considering an academic career, and for women who are already struggling with male-dominated academic institutions, *Lifting a Ton of Feathers* is a light read. It is a book of lists and anecdotes, and lists of anecdotes. The advice given is generally good and sensible—find yourself a mentor, discuss your concerns and feelings with sympathetic colleagues, and make sure you fully understand the policies and practices relating to tenure. But the academic women who are already making it on my own male-dominated campus seem far too bright and capable to have needed such obvious tips. And reassuring though it may be to find that others have felt the brunt of male insensitivity or have been unheard on male committees, one wonders if the chronicles of remembered hurts and past wrongs does more that turns women inward toward a negative downward spiral. Will *Lifting a Ton of Feathers* give academic librarians a better understanding of the environment in which they work? Perhaps, but more useful would be a few lunches with women faculty colleagues, and some time spent in those committee meetings. (*P.R.*)

Berman, Sanford. *Prejudices and Antipathies: A Tract on the LC Subject Heads Concerning People.* Jefferson, N.C.: McFarland, 1993. 211p. $19.95 (ISBN 0-89950-828-6).

The 1993 edition of this classic from library literature reprints the 1971 edition, adding a foreword by its first publisher, Eric Moon, a new preface by the author, a brief bibliography, and a revised index. Library school students who delighted in this revolutionary tract in 1971 are now mid-career librarians. Im-

proving the Library of Congress subject headings has been a hot topic for over twenty years in library literature and at conferences, where Berman continues to make his case for reform, relying on a seemingly endless supply of good examples from the Library of Congress. Nine editions of LC Subject Headings (LCSH) have appeared since Berman first called attention to its racial and cultural biases. Many of the remedies he proposed have been adopted; however, according to Berman, his 1971 book "just didn't go far enough," and the world of LCSH is still greatly in need of mending. To this end, he provides seven petitions to the Library of Congress for specific heading revisions, ready for convinced readers to sign and send. (*M.R.*)

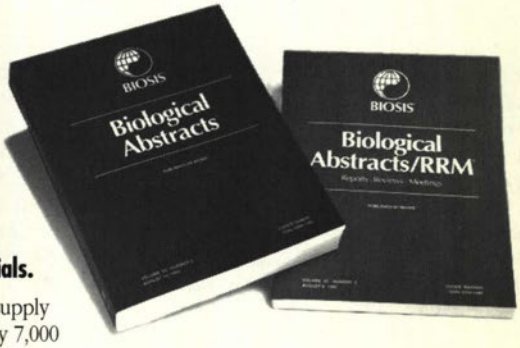
Sourcebook for Bibliographic Instruction. Prepared by the Editorial Board of the Bibliographic Instruction Section. Chicago: Association of College and Research Libraries, 1993. 89p. $18.99, $16.92 for ACRL members (ISBN 0-8389-7673-5).

This collection is intended as a hands-on aid to librarians who teach or administer instructional programs. Lori Arp provides a useful introduction to behavioral and cognitive learning models in the library context. The remaining contributions—on instructional design, teaching methods, and the evaluation and management of a bibliographic instruction program—will help librarians who wish to be introduced to the basic contours of instructional issues and who can use checklists and flow charts in implementing their programs. Supplementary materials include a list of recommended readings, organizations, and electronic bulletin boards. (*S.L.*)

Contributed by Martha L. Brogan, Stephen Lehmann, Patricia Renfro, Margaret Rohdy and Bob Walther.

For Access to the World's Life Science Literature, **There's No Comparison.**

When it comes to comprehensive, cost-effective life science reference tools, there really is no comparison. ***Biological Abstracts®*** and ***Biological Abstracts/RRM® (Reports, Reviews, Meetings)***, are the foremost sources for multidisciplinary coverage of the world's life science research literature.



BA: Your Link to 7,000 Worldwide Serials.

In 1993, ***Biological Abstracts (BA)*** will supply 280,000 article citations derived from nearly 7,000 international sources. Each ***BA*** record contains an author-written abstract so researchers can save time determining an article's relevancy to their research topic.

BA/RRM: Your Source for Papers From 1,500 Meetings.

Biological Abstracts/RRM (BA/RRM) is the essential publication needed for access to 180,000 references to international meetings – no other source supplies this vital information. Plus, ***BA/RRM*** contains citations to reports, books, reviews and software.

Look to BIOSIS First!

For all your life science research questions, look to BIOSIS first. We think you'll agree that no other reference tools compare to ***BA*** and ***BA/RRM***. Find out for yourself – subscribe today!

Call toll free 1-800-523-4806 (USA and Canada); (215) 587-4847 (Worldwide). Or, complete the coupon.

BIOSIS®

Yes!

Send me a free copy of ***How to Use Biological Abstracts and Biological Abstracts/RRM (Reports, Reviews, Meetings)***.

Name

Title

Organization

Address

City State

Country Postal Code

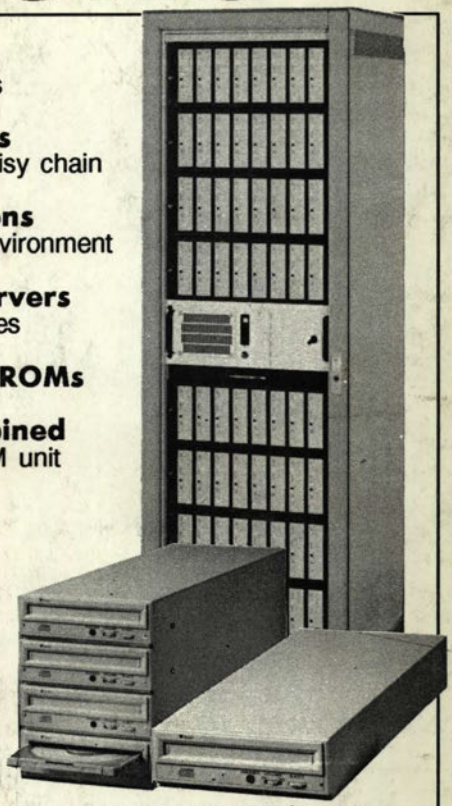
Telephone

Return this coupon to BIOSIS, Inquiry Fulfillment CRL1193B4, 2100 Arch Street, Philadelphia, PA 19103-1399 USA, or the Official Representative or Authorized Distributor in your area. Fax (215) 587-2016; Internet: biosis@a1.relay.upenn.edu

CD-ROMs

networking • multimedia

- **security keylocks** for public access areas
- **expandable towers** with the capacity to daisy chain
- **networking solutions** for your workstation environment
- **massive optical servers** up to 64 CD-ROM drives
- **single desktop CD-ROMs**
- **space-saving combined** computer and CD-ROM unit
- **multimedia** CD-ROM units
- **accessories**
- **CD-ROM discs**
- **reference libraries**



Todd products use an Hitachi mechanism with the fastest access time available- under 300 msec.

When you buy a Todd product, it is with technical support. Our 800 number is available whenever you need assistance. Todd products are remarkably reliable and are warrantied. Whether you are an expert in computer systems needing detailed specifications, or someone needing basic orientation to CD-ROMs... WE CAN HELP.

TODD ENTERPRISES INC.

For additional information, call... **800 445-TODD**

718 343-1040 • FAX 718 343-9180 • BBS 516 829-0212

224-49 67th Ave., Bayside, NY 11364